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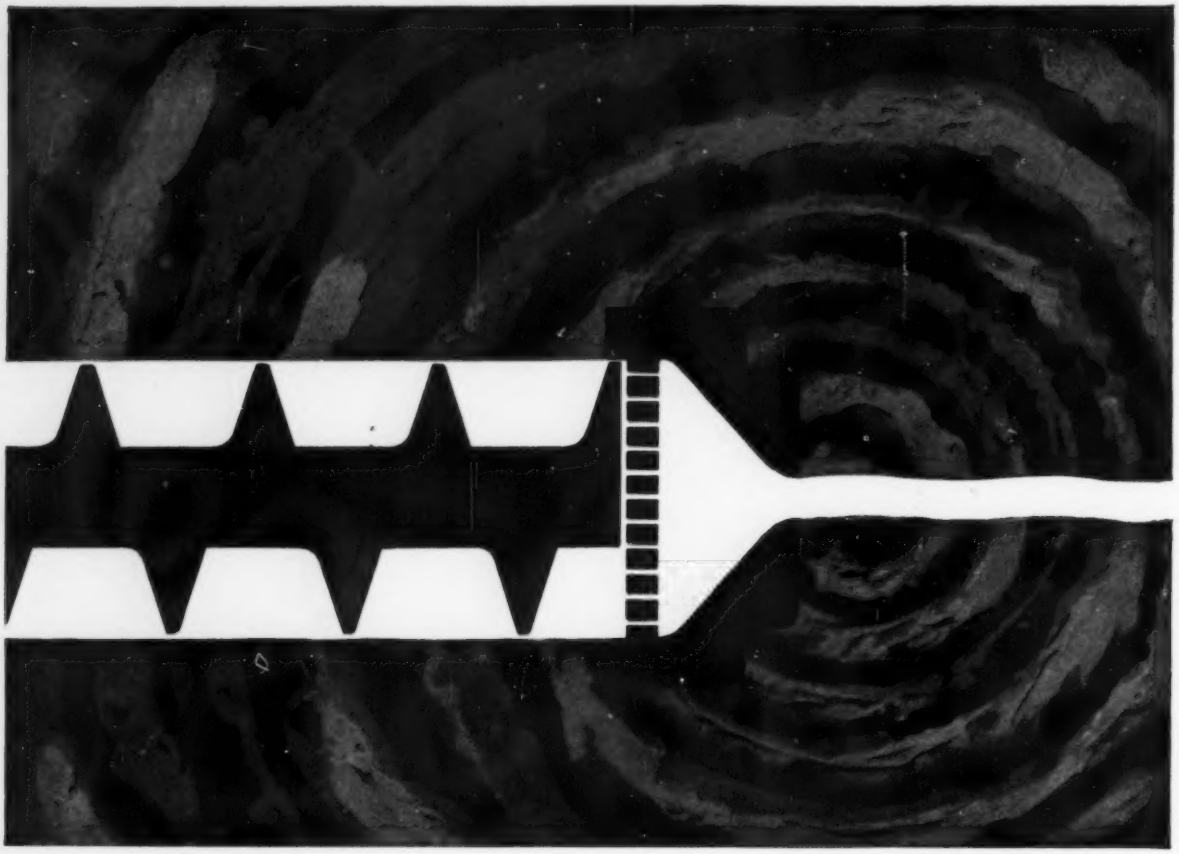

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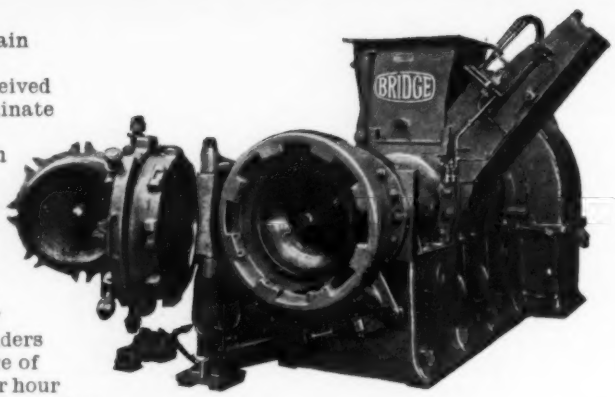

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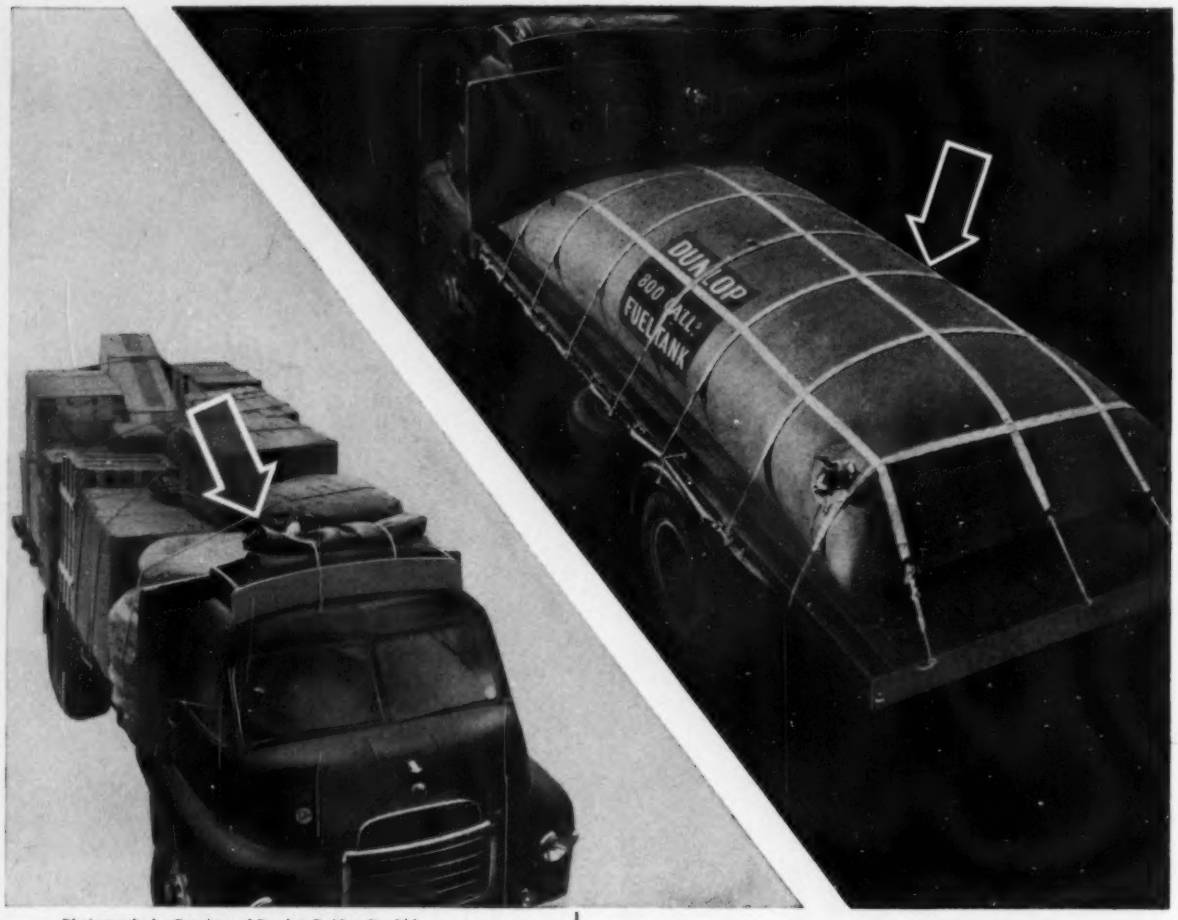

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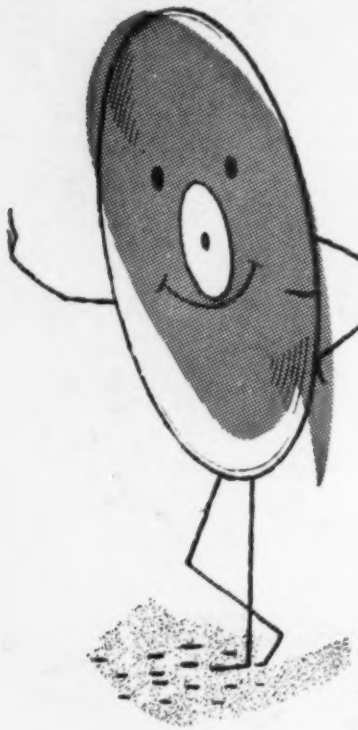

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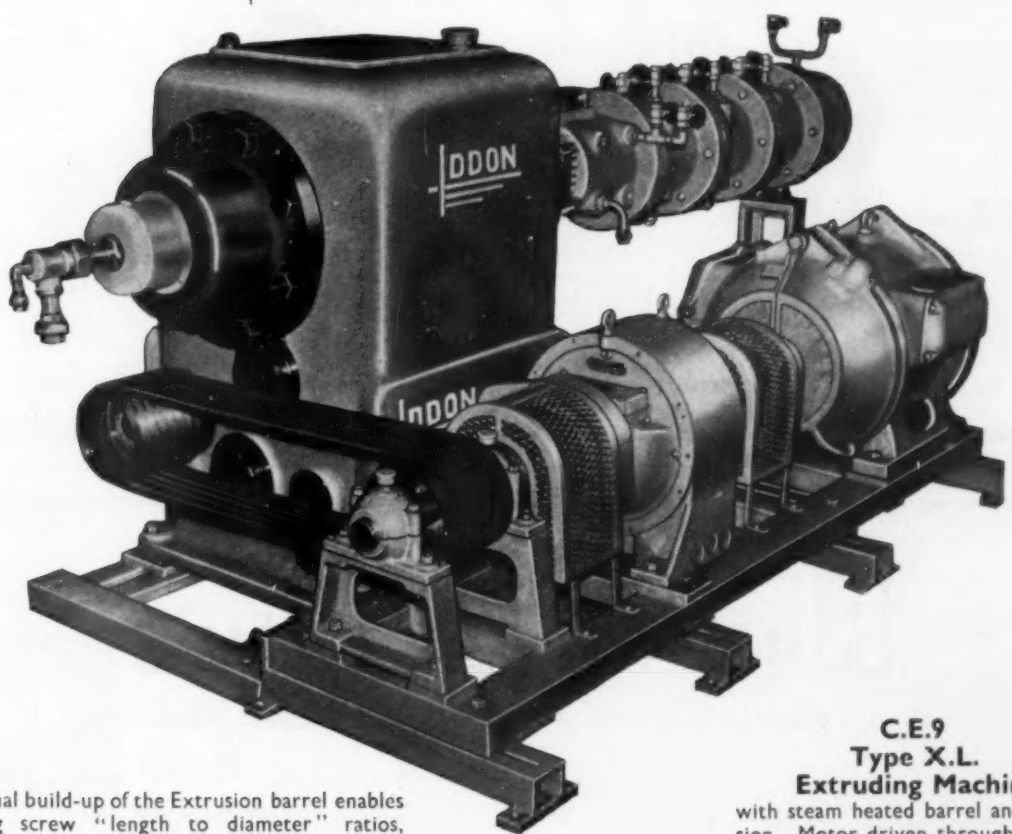

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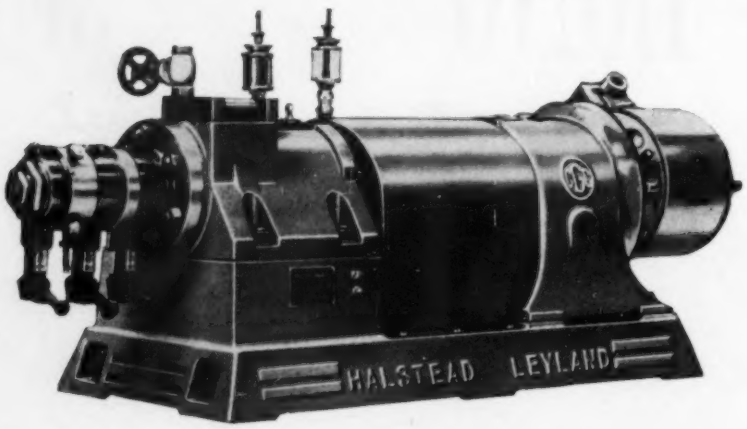

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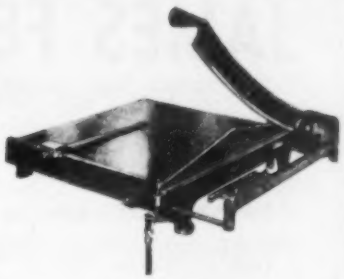

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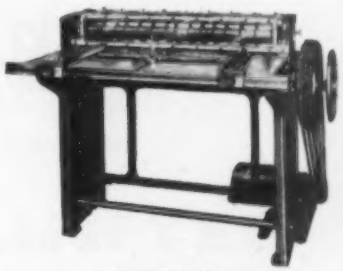

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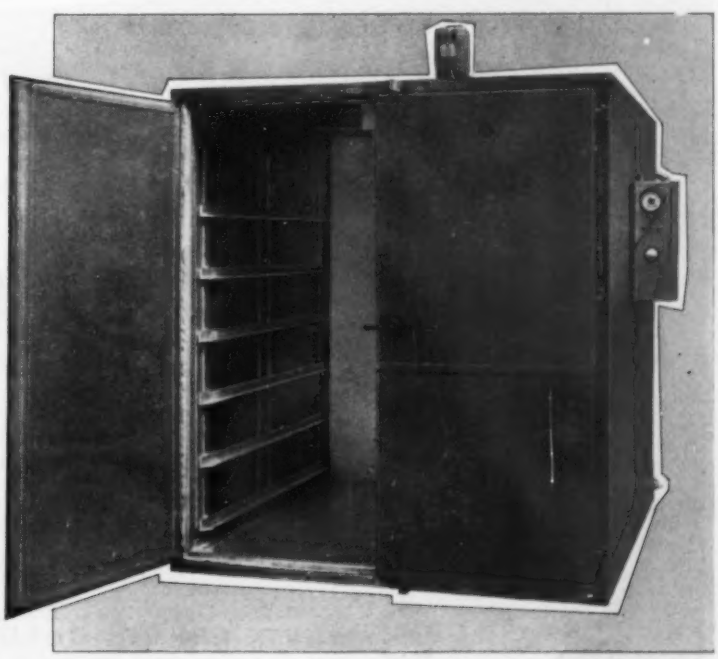

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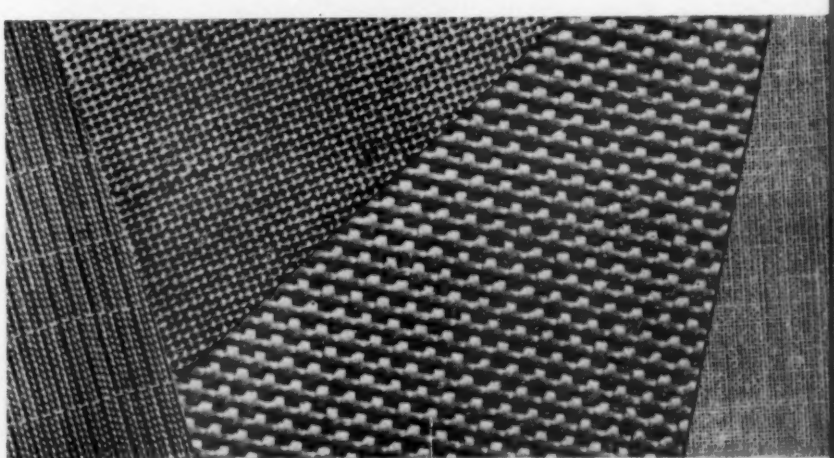

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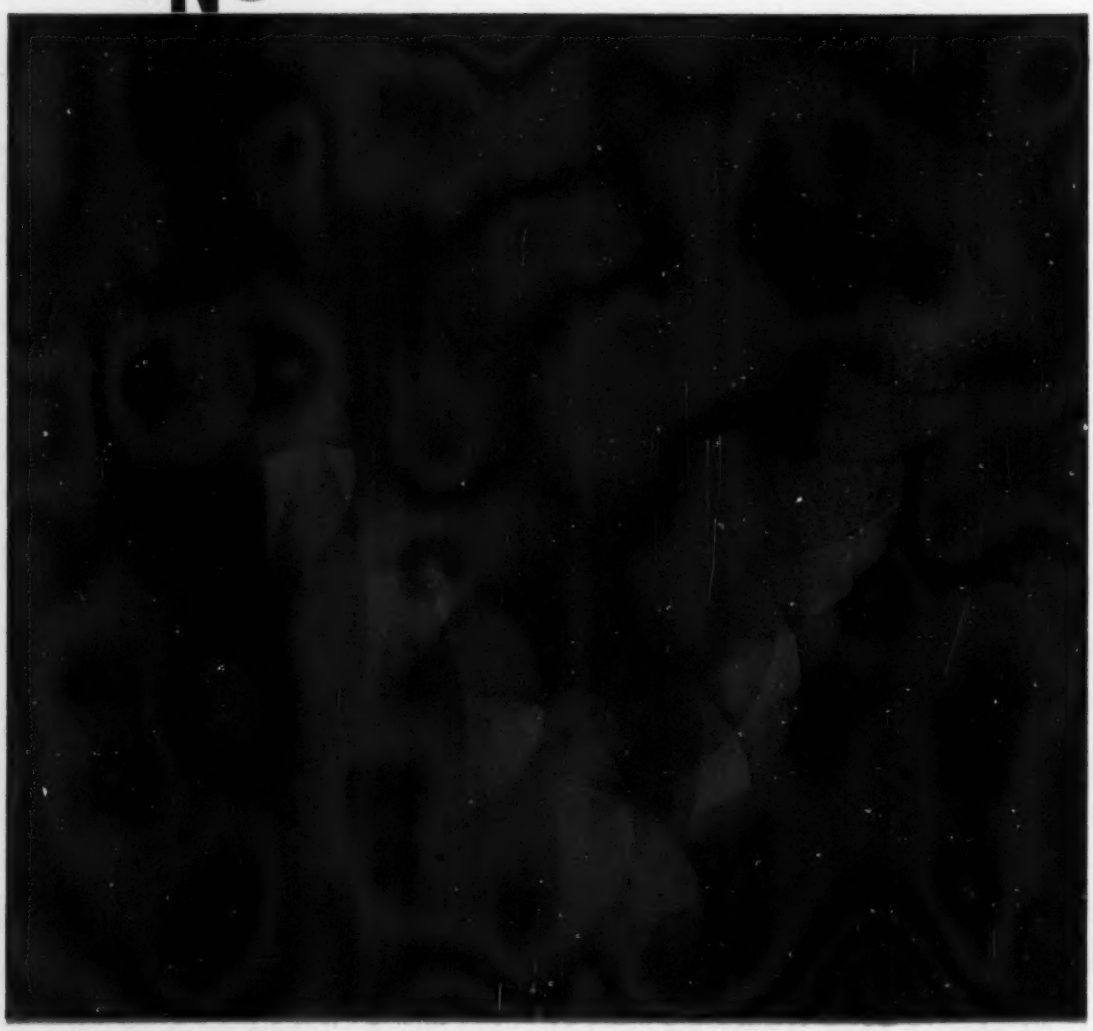

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Volume 139 Price 1s. Post free 1s. 4d. No. 3
IN ITS 76th YEAR

July 16 1960

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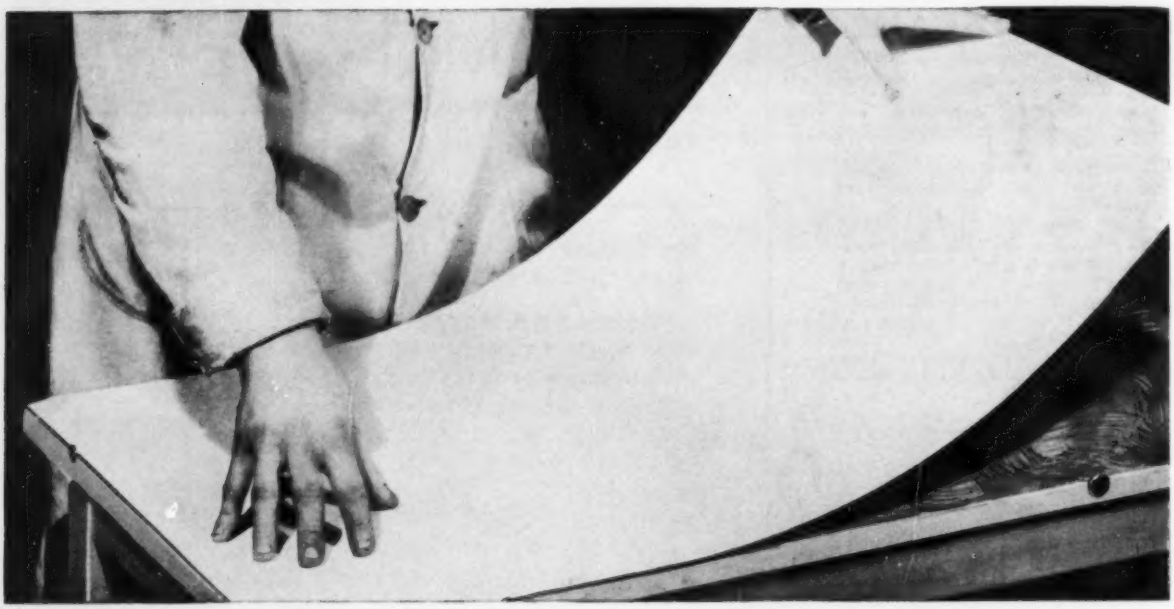

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NOTES of the WEEK

Plastics Appetite

THE slight weakening of orders in recent weeks has left plastics raw material manufacturers quite undismayed, more especially as the increasing rate of demand so far this year has meant that some raw materials are in short supply. There is, of course, almost an embarrassing number of outlets for plastics in practically every industry, and as many that have yet to be thought of. To talk of competition in the present state of the plastics raw materials producing industry might seem superfluous, but it is undoubtedly getting tougher with the extension by the petroleum companies of their interests in chemicals and synthetics. Demand, however—barring temporary slackening or 'Chancellor's recession'—must continue to rise. The potential appetite for plastics is so vast that, even with the existing materials, it cannot yet be measured.

World demand continues to grow at an even greater speed than in the UK and this country's industry looks like retaining a reasonable percentage of it, although there is clearly scope for improvement, not only in EFTA and EEC, but east of the Oder-Neisse line where some progress has already been made.

Dunlop Aids Teaching

THE 50th anniversary of Dunlop Plantations Ltd. occurs this year. To commemorate it, a new kind of visual aid for schools has been evolved and issued to public and grammar schools by Dunlop. This takes the form of what is described as a photoset entitled 'Rubber Production in Malaya' and consists of 40 identical sheets of photographs and diagrams for distribution to each member of the class, together with a teacher's booklet containing background information and suggested exercises. The photoset has some obvious advantages over wall charts and film strips. Usually the former cannot be seen clearly by everyone, while the latter requires a projector and usually a blackout.

The teacher's booklet has been prepared by R. C. Honeybone, head of the geography department, University of London Institute of Education. The photoset, providing something that each student can study individually under the guidance of his teacher, gives them also an opportunity to think and discover things for themselves. It illustrates very clearly the stages of rubber production on a Dunlop Malayan estate—in this case the Regent Estate. A large picture, detailed enough for a student to imagine himself actually on the estate, is duplicated in an annotated diagram in the booklet. Suggested exercises include questions on climate, rainfall, and shipping routes to main consuming countries. As Mr Honeybone points out, children can be encouraged to think for themselves. For example, a picture of a tank vehicle with a heavy shadow underneath it suggests clearly enough the bright and almost vertical sun of equatorial regions.

It seems a most effective means of getting across not only the basic story behind an important raw material for one of our largest industries but also a singularly painless method of inculcating quite a significant amount of geographical knowledge. All in all, an admirable way in which to commemorate anything.

Many an Export Mickle

SMALL and medium-sized businesses, whose managements at present never think of exporting their goods, could aggregate a trade worth £10m. a month, according to Sir Frank Bower. The problem, said Sir Frank, making his presidential address to the Association of British Chambers of Commerce, was to persuade a man to venture into an unknown and possibly more competitive market when he could sell his output at home without much effort and with a satisfactory profit. It was fruitless, he said, to exhort a manufacturer or trader to export as a form of self-sacrifice for some distant cause. It had to be demonstrated to him that he could do overseas trade at a profit. He might be glad of alternative outlets if home trade declined while, at the worst, any additional sales, even at cost, could help him to carry his overheads. Emphasis was also laid at the same meeting on the need to increase trade between the members of EFTA.

There are without doubt a goodly number of relatively unexplored trade avenues—particularly in 'special lines'—which could with profit be investigated by smaller and medium-sized rubber and plastics companies. The idea of having a go at exporting is one that every company should look into. The Board of Trade regularly reports cases of the successful entry of companies into markets of whose existance they were previously unaware.

NEWS *Briefs*

GERMAN PLASTICS PLANT FOR USSR — RUBBER IN MADRAS—US TYRE PRICES — MONTECATINI CAPITAL UP — AUSTRALIAN PLASTICS EXPORTS

●**Holland** — A banking syndicate headed by the Netherlands Trading Society has announced the introduction of Pirelli certificates on the Amsterdam Stock Exchange. Each certificate represents ten shares with a nominal value of 1,000 Italian lires each.

●**India** — The Madras Forest Department for the first time is trying to grow rubber. But out of about 40,000 acres available within the reserve forest area, not more than 3,500 have been found suitable. The Government has decided on an eight-year plantation plan which will cost 2.7m. rupees.

●**Dominica** — With a programme for 1960-61 for the distribution of 200,000 rubber tree stock, the department of agriculture is giving the greatest encouragement to date to the expansion of the rubber industry. Two factories have recently begun production.

●**Burma** — Rubber figures among the commodities which Burma will export to the USSR under the terms of the trade agreement between both countries which, expiring on June 30, was extended for one year by an exchange of notes in Rangoon on June 28.

●**Australia** — Westralian Plastics Pty. Ltd. has doubled the size of its plant in the past year. According to acting Industrial Development Minister Ross Hutchinson, Western Australia will export large quantities of plastic goods to S.E. Asia, including Singapore and Malaya, in the near future.

●**Malaya** — An official cable to the office of the Trade Commissioner for Singapore in the UK gives preliminary total ocean shipments of rubber for June 1960 as 87,866 tons.

●**United States** — Truck tyres in USA are up some 8% following elimination of a year old discount to dealers. Elimination of the discount which amounted to 7½% was initiated a week ago by the US Rubber Company and has become general in the industry, the Goodyear Tire and Rubber Company making the move effective from July 7. Other truck tyre producers taking the action include the Firestone Tire and Rubber Company, the B. F. Goodrich Company, Sieberling Rubber Company and the General Tire and Rubber Company. The reason for cancelling the discount, according to several company spokesmen, is the high price of natural rubber in recent months and other rising manufacturing costs.

●**Italy** — Montecatini proposes to increase its capital from Lire 100,00m. to Lire 150,000m. and to issue 50m. new Lire 1,000 shares. Of these 40m. shares will be offered on a four-for-eleven rights basis at par plus a Lire 1,000 premium, according to a Milan report. The balance of 10m. shares will be issued as to 8.5m. to complete the merger of Societa Vetrocoke and 7.5m. shares will be reserved for the staff. Production of plastics, synthetic fibres and chemicals is to be increased.

●**Australia** — Union Carbide Australia is to double the capacity of its polythene plant now under construction at Altona, Victoria. Capacity will go up from 15m. lb. to 30m. lb. a year. The first stage of the plant will be in production by the middle of 1961.

●**United Kingdom** — British Industrial Plastics have announced that merger negotiations (*RJIP* June 18, 948) have been discontinued. The directors report that the improvements in profits has been more than maintained.

●**Japan** — Two new Japanese-American companies are being formed to meet the growing demands for polythene in Japan. Mitsui Petrochemical and Du Pont, which constitute one of these, plan to build a plant at Otake. Production is scheduled to begin in 1962. Nitto-Chemical and Union Carbide expect to open their new plant in 1962.

●**Germany** — New quota lists, relative to the trade agreement between Western Germany and the USSR, include the following for shipment from Germany: complete sets of equipment for factories for low density polythene, high density polythene — each with an output of 24,000 tons; and polypropylene, 10,000 tons. Included also are forging manipulators for rubber tyres, carrying capacity up to 15 tons; equipment for processing polythene to foil and two installations for manufacturing polythene table cloths. Quotas for shipments from the USSR include 35,000 tons of asbestos.

●**Israel** — Tyres, inner tubes and tyre armour for vehicles to the value of US$2½m. will be exported from Israel to Turkey under the terms of a trade agreement.

'"Here I've been," she says, "slavin' over an 'ot stove all day," she says.'—493

New Dunlop Tyre

SAFETY, COMFORT AND SILENCE IMPROVED

A NEW car tyre, the Elite, has just been announced by Dunlop. This tyre is the result of an intensive research and test programme carried out by the Dunlop Research Centre and the Synthetic Rubber Plant at Fort Dunlop. The tyre division laid down their requirements for a material with better wet road grip and absence of squeal, and the central research division produced the answer by developing in a very short time a new synthetic rubber.

Butadiene-styrene

It has been known for some time that high hysteresis rubbers show striking advances in several of the properties desirable in tyres. In particular these rubbers, absorbing a large part of the energy put into them, can develop a very high coefficient of friction. For this reason there has been speculation in the Press and the House of Commons, about the possibility of using high hysteresis rubbers in tyre treads. However, earlier high hysteresis rubbers were incompatible with normal rubbers and were difficult to handle in production. They also had other properties which made them less than ideal for tyre construction. The work done at Fort Dunlop has resulted in the production of a high hysteresis rubber which can be modified to give exactly the balance of qualities required and which can be used in conjunction with the more conventional polymers. This rubber, which is a butadiene-styrene copolymer with a fairly high styrene content, is used for the tread of the new tyre and this results in a striking improvement. The tyre represents a significant step forward in safety, comfort and silence, and in comparison with today's standard tyres, offers up to 45% more resistance to wheel spin, 24% better wet hold in cornering and 15% more grip in braking. Cornering squeal is virtually eliminated. The mileage potential and speed capabilities are about the same as the standard Gold Seal tyre, and there is a slight increase in rolling resistance which should improve the fuel consumption slightly.

The new rubber is at present expensive to produce and the Elite tyre, which will be tubeless with nylon casing, and in black or white sidewalls, must for the time being be regarded as a luxury tyre for the motorist who is prepared to pay more for an important advance in safety and comfort. For this reason it is as yet being made only in sizes which fit luxury saloon cars and this limited range will, it is hoped, be available later in the year.

Sizes and prices which will be

available range from 6.40-15 suitable for the Jaguar 3.4 at £11 6s. 6d. black sidewall, to 8.90-15 white sidewall suitable for the Rolls Royce Phantom 5 at £27 5s. 6d.

SR Emulsifiers in Australia

Plans for the building of a plant in Australia to produce rosin-based emulsifiers for use in synthetic rubber manufacture and chemicals for use in paper production were announced this week by the Hercules Powder Company. The emulsifiers would be used under a long-term sales contract by the Australian Synthetic Rubber Company. The new plant will be ready for production next year under management of Hercules Powder Company (Australia) Pty. Ltd., organized as a subsidiary of the Hercules Powder Company of the US and A. C. Hatrick Pty. Ltd. of Australia.

SILICONE RUBBERS PRICE CUT

Midland Silicones announce that immediate price cuts of up to 10% have been made in cases of several large volume established grades of the Silastomer series of silicone rubbers. Reductions have also been made in the prices of some of the newer development grades of silicone rubbers.

Established grades carrying up to 10% reductions include Silastomer 50, 80, 122, 125, 152, 156, 160, 181 and 6-126; Polysil 2432. Production of newer grades is not yet sufficiently great to enable the company to consider price reductions in all cases but reductions have proved possible in the case of grades DP.2455 and Silastomer 2472, 2473, 2474 and 2475.

The full range of prices (500lb. lots) is as follows (previous price in parenthesis): Grade 50: 28s. (30s.). 80: 28s. (30s.). 122: 24s. (26s.). 125: 24s. 9d. (27s. 6d.). 156: 30s. 9d. (34s. 3d.). 152: 28s. (30s.). 160: 15s. (16s. 6d.). 181: 18s. 6d. (20s.). 6-126: 25s. 6d. (28s.). 2455: 30s. (32s.). 2472: 31s. (34s.). 2473: 31s. (34s.). 2474: 31s. (34s.). 2475: 31s. (34s.). Polysil 2432: 33s. (36s.).

Rubber Liferafts in New Zealand Ships

The New Zealand Marine Department and New Zealand shipowners and maritime unions had agreed in principle to compulsory provision of inflatable rubber liferafts on all New Zealand home trade ships, according to Marine Minister Fox in a comment on new shipping and lifesaving appliance rules gazetted last week. The new rules resulted from recommendations of the Court of Enquiry into the foundering of M/V 'Holmglen,' lost with all hands off Timaru last year.

The Minister said that, in the case of home trade passenger ships, provision was made for the carriage of inflatable rubber liferafts in new ships and the gradual replacement of conventional buoyant apparatus in existing vessels. Provision has been included for the alternative carriage of inflatable liferafts or lifeboats in home trade ships of less than 100ft. in length, he said.

The directors of William Warne (Holdings) announce in connexion with the recent rights issue at 10s. per share that 98.33% have been taken up and paid for by the shareholders.

Physical Properties of Coated Fabrics*

By V. K. HEWINSON

Summary: Factors influencing the tear strength and resin/cloth adhesion of coated nylon fabrics are discussed. Consideration is given particularly to the effects of cloth construction and coating penetration. The possibilities of core-textured yarns are described.

'THE Mechanism of Tear in Industrial Coated Nylon Fabrics' is the title of an article (published in 'Nylon Outlook' Vol. 2, No. 7, Winter 1959/60), which enumerates and illustrates those factors which are felt to have a marked influence on the recorded values of tear strength. The views expressed therein are those at present and should be useful guidance to those actively engaged in the field of coated fabrics.

The article shows how extremely complex is the interaction of fabric and coating. Those factors which affect tear strength in uncoated fabrics also apply in coated fabrics; some are magnified and some additional effects come to light once the coating has been applied. The most critical variables discussed are those of fabric weave, yarn crimp, coating quality, coating location on the yarn system, and coating penetration into interstices. However, the problem arises immediately of how to set about controlling the variables in order to establish these ideas experimentally. Most of these variables are interdependent. For example, slight variations in fabric tension during coating upsets the balance of warp and weft yarn crimp and the tendency is towards low warp and high weft values. This occurrence then influences the extent to which coating penetrates the weft yarns. Coating quality variations can be eliminated by using a standard formulation and a fixed processing cycle throughout the experiments, but there still remains the problem of controlling the penetration of the coating layer. Subsequent to formulating the above ideas, a development programme has been commenced which is aimed at a closer examination of some of the most important factors associated with coated fabrics:

(i) The dependence of coating adhesion on interstice size and the consequent influence on tearing strength.
(ii) The influence of twisted yarns in the fabric structure.
(iii) The effects of various basic fabric weaves.

It is proposed to describe the experiments, to give the findings to date, and to discuss their implications.

*Paper delivered at British Nylon Spinners' first industrial convention, May 1960.

Introduction

The standard types of plain weave 'low-twist' fabrics seem to have been accepted in this country without much questioning. At first glance, this would seem very logical for, in theory, they would be expected to permit the maximum yarn mobility and backing-up of successive yarns to form a large 'del' to resist the applied tearing force. Low-twist fabrics are, of course, cheaper than a twisted counter-part.

To establish whether these fabrics were, in fact, the 'last word' in their field, it was decided to examine fabrics containing various basic yarn twists. Now, for a given supply yarn, increasing twist reduces yarn diameter. Thus, by selecting a given fabric construction (plain weave, constant ends and picks/inch), and using the same supply yarn containing various twists, a convenient means of varying two of the important variables can be arrived at, namely:

(i) Interstice area is increased with increasing yarn twist, and hence coating penetration is increased.
(ii) Increasing yarn twist reduces coating penetration into yarn filaments at the doctor-knife (warp and weft crimps in each fabric being equal).

Effects solely attributable to the fabric weave of uncoated fabrics can be examined by varying the weave for a fixed yarn, twist, and end and pick rating. The drawback with coateds is that interstice size varies and hence coating penetration. In addition, the ratio of yarn surface area (available for chemical bonding) to interstice size varies. Hence, in coateds, tear strength is not simply a function of the float length of the yarns.

Experimental

Five plain weave fabrics, each with nominally 44 x 44 ends and picks/inch in the loomstate and 38in. wide, were woven from 210-denier yarn. The basic yarn twists in both warp and weft were different for each fabric and were 1, 3, 6, 9 and 12Z tpi. These fabrics were woven from Syncolsized warps and were scoured and set under as similar conditions as possible. Jig scouring was employed and heat-setting was carried out at 420°F. for about 30 seconds.

Standardizing on 3Z twist, a 2 x 2 twill and a 2 x 2 matt or basket weave were woven with the same ends and picks as the above plain weaves. Both these fabrics were too loose and easily distorted to be jig scoured and so they were wound on a 'star' frame, collapsed into hank form and scoured in a crepe-ing tank. They were subsequently heat-set under the same conditions as the plain-weave fabrics.

The heat-set fabrics were split into three equal widths and the edges resin-treated to prevent the yarns spraying away from the edges of the cloth and winding around the rollers of the laboratory coating machine. Trials showed that it was quite impossible to spread coat the higher twisted fabric on the existing set-up, so it was decided that the fabrics should first be dip-coated with a lower viscosity PVC paste. In this way, the interstices would be completely penetrated, as desired, and then the fabrics could be subsequently spread with the higher viscosity paste before the final 'gel.' The coating set-up is shown in Fig. 1.

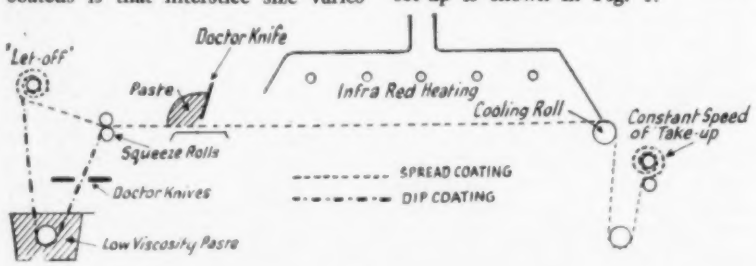

Fig. 1

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To obtain a reasonable level of adhesion, 10 pbw of Vulcabond TX were incorporated in the low-viscosity paste. This quantity was chosen in the expectation that the adhesion obtained would be a representative average figure for adhesions obtained in the trade. After coating to as nearly as possible the same coating thickness for each, the fabrics were festooned and stored at a substantially uniform temperature for at least seven days, to allow the bond to mature.

Testing

From the heat-set fabrics, test pieces were selected for the following measurements:

(i) Warp and weft yarn strength.
(ii) Warp and weft yarn crimp.
(iii) Weight per sq. yd.
(iv) Ends and picks/inch.
(v) Interstice area.

The first four tests were repeated on the coated fabrics, in addition to which the following were made:

(i) Warp and weft fabric tear strength.
(ii) Coating/fabric adhesion.
(iii) Coating thickness.

Coating Adhesion

There are probably three main factors which contribute to the magnitude of adhesion. The first obvious one is that of interstice size. Clearly the greater the cross-section of the coating 'claw' completely penetrating the fabric, the greater the force to break it. Secondly, there is the contribution of the chemical bond between the nylon coating interface; and, finally, there is the additional hold produced by any mechanical keying into the yarn filaments. It is very complicated to separate precisely the components due to yarn keying and chemical bonding, since the actual complete coating fabric interface is not simply the circumference of the yarn but is also the surface of the filaments in contact with impregnated paste.

Fig. 2 is a plot of adhesion against interstice area. This shows clearly that adhesion is markedly dependent on coating penetration. The adhesion is seen to increase linearly with interstice area and to cut off an intercept on the adhesion axis. This value of adhesion is that for a fully 'jammed' fabric having no open interstice for penetration. From the above then, the intercept (Ao (10)) consists of the chemical and yarn keying components. The straight line graph leads us to conclude that, for this series, either (i) both these factors remained substantially constant, or (ii) their resulting component remained constant.

This series is at present being repeated with (i) 20pbw of Vulcabond, and (ii) no Vulcabond. If the above theory is correct, then it is anticipated that the plot of adhesion against interstice area will again be linear, although the slopes may be different due to the influence of isocyanate content on the 'claw' strength of the coating. The intercepts Ao (20) and Ao (0) will also each be greater and smaller than Ao (10).

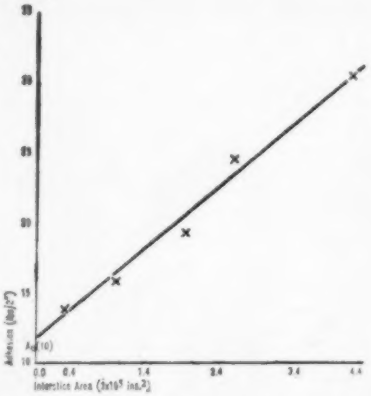


Fig. 2

Further work is intended with another series of fabrics of greater denier and lower set to exaggerate yarn mechanical keying while increasing the interstice areas in the same proportions as the present series.

Yarn Strength

Fig. 3 shows that the heat-set yarn strengths decrease slightly with increasing twist (as expected), except for the weft of 12Z. This increase may be due to slightly greater tension at heat setting. However, the greatest difference of yarn strengths for this series occurs between 3Z warp and 12Z warp and is only 0.32lb. The greatest difference in weft strength is 0.16lb.

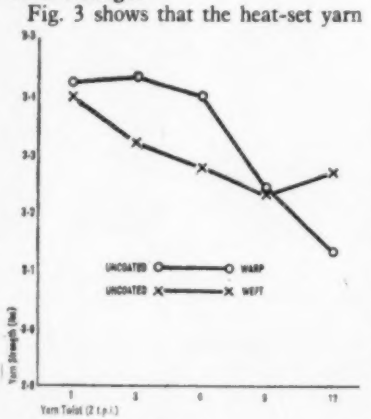


Fig. 3

Tear Strength

Tear strength against yarn twist is plotted in Fig. 4. Neither warp nor weft strengths fall at all significantly for yarn twists from 1Z to 6Z. Presumably, although the interstice area has increased considerably (and it would be expected that the increased penetration of coating would block the 'backing-up' of yarns in the active region of tear), the increase in twist has successively reduced the coating from penetrating into the yarn filaments, so increasing yarn mobility along their length and compensating for blocking effects.

However, both warp and weft strengths fall considerably from 6Z to 9Ztpi. The most obvious reason for this fall is that the increased blocking effects in the larger interstices of the weave for 9Z are considerably greater than for 6Z, and are not compensated this time by sufficient reduction in yarn penetration.

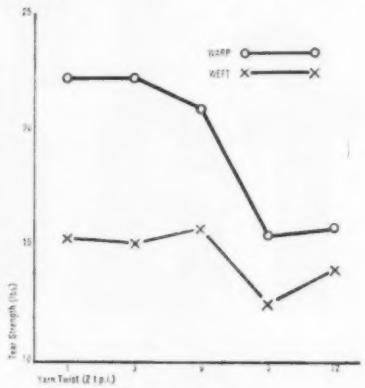


Fig. 4

The warp tear strength of the 12Z fabric is no lower than for 9Z, suggesting that the interstices of 9Z are at an optimum for blocking effects. Actually, the weft strength rose a little for the 12Z, but this may be a combined effect of greater yarn strength and also additional reduction of paste impregnation into weft yarns. As mentioned, this trial is being repeated with no isocyanate bonding and also with 20pbw Vulcabond TX. It is expected to find that the tear strengths are lower for the increased isocyanate series, but higher for the untreated series. It will be of greatest interest to see whether the trend of changes from one twist to the next varies in the same way as that already described.

The article previously referred to suggests that crimp is thought to play a very significant role in directional tear strength. The weft crimp in this experiment was on the whole slightly higher than the warp, but

the values were kept fairly uniform for this series and so this variable was successfully eliminated.

Effect of Weave

Tear strength against weave is plotted in Fig. 5. There is no significant increase in the warp of 2 x 2 twill, but the weft does increase somewhat. The 2 x 2 matt weave has the greatest tear strength of this trial in both warp and weft.

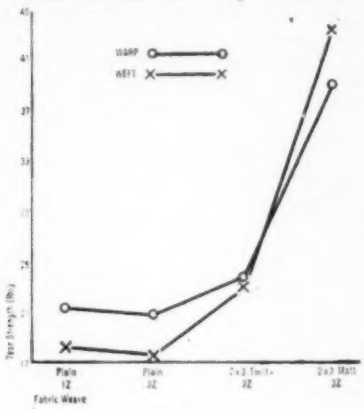


Fig. 5

The most likely explanation for the increase in tear strength from plain 2 x 2 matt weave is that float length and width both increase and consequently are 'locked' by coating at 42 (plain) and 13 (matt) alternating inter-sections per unit area. The 2 x 2 matt is thus increasingly distortable and able to present more reinforcing yarns in the 'del' to resist the tearing force. It should also be remembered that the ratio of the number of interstices per unit area for the plain weave fabric to that for the 2 x 2 matt is 9:1 which must certainly introduce penetration 'blocking' effects.

Adhesion Using Bulked Yarns

Amongst several other development projects, not mentioned above, is one which was pursued to investigate the possibility of promoting fabric to coating adhesion using yarns with hairy or looped surfaces.

To evaluate the potential of these types of yarn in coated fabrics, fabrics woven from four combinations of 840/136/1Z yarn and 840/136/1Z/70/34/½Z core textured Taslan yarn were spread coated with Geon 121 PVC.

It is seen that the adhesion is increased by using core-textured yarns and that values are achieved which are equal to those obtained in the trade using isocyanates on standard constructions. However, until it is possible to produce flatter loops, the several shortcomings of these yarns for use in conventional coated lightweight covers will remain:

(i) coated weights are higher than for unbulked yarns;
(ii) looped filaments penetrate the coating surface producing undesirable 'wicking' properties (solvents penetrate fabric by capillary action along filaments);
(iii) the loops form a series of peaks which, when coated, form ready points for attack by abrasion and scuffing.

The greatest possibility for these textured yarns at present is in those applications where high adhesion is required between fabrics with substantially thick coating, *e.g.*, static fuel tanks, conveyor belts, etc.

Regarding the frequent desire for equal warp and weft tensile and tearing strengths, it has been observed that core-textured Taslan yarn used in warp only serves to equalize strength. The coating is predominantly keyed to the warp instead of to the weft and the result is more equal mobility of the fabric weave.

Conclusions

The major factor contributing to adhesion is that of coating penetration. Adhesion is directly proportional to interstice area.

2 x 2 matt weave produces the greatest tear strength.

Using core-textured Taslan yarns in base fabrics, either in total or as either warp or weft only, increases coating to fabric adhesion.

It is intended to coat the above series of fabrics on a recently installed full-width spreading machine to establish whether, in fact, the findings for the dipped and spread fabrics extend to fabrics spread-coated only.

Spread-coated fabrics, because of the predominant influence on the weft yarns, are also expected to be dependent on yarn twist for tearing properties. Findings may indicate the following lines for investigation:

(i) Use of twisted yarns in weft only.
(ii) Influence of different pick ratings to achieve balanced strength.

Plastics in India

BIG EXPANSION OF PRODUCTION PREDICTED

G. N. PARIKH, president of the All India Plastics Manufacturers Association, speaking at the opening of the Calcutta branch on June 27 said that nearly Rs.22 crores are invested in the industry which employs about 25,000.

'During the second plan period (1956-61),' he said, 'a ten-fold expansion of production of plastics amounting to nearly 13,000 tons by 1961 has been aimed at. The trend in India is at present towards self-sufficiency in raw materials, machinery and moulds. Manufacture of injection moulding machines, compression machines and extruders, have been started and also of several raw materials like phenol, formaldehyde, urea, polystyrene and polythene.

The present consumption of plastics materials is 25 to 30m. lb. per year. It is expected that during the third plan period there will be about five-fold expansion in production. The association estimates that by the end of 1960 the annual requirement of various raw materials will be 66,900 tons and has suggested to the Government a target capacity of 83,625 tons.

Polyester Splints

The Prince of Wales Orthopaedic Hospital at Cardiff is now using reinforced plastics to make up specialized surgical appliances. British Resin Products' Cellobond polyester resins have been chosen; the splints and appliances are drilled and bolted without affecting the strength of the laminate, and felt is bonded inside to give patients the maximum degree of comfort.

Hungary's foreign trade company, Kultura, is exporting plastic cat skeletons to New Zealand for use in schools.

The floor of this ward at the Botley Park Hospital, Chertsey, has recently been covered with 'Phenco' continuous PVC flooring manufactured by the Phoenix Rubber Co. Ltd., of Slough, Bucks

Better This Year

NEWS FROM SOUTH AFRICA

THE chairman of the South African Dunlop Company, in announcing a drop in taxed profit from £306,063 in 1958 to £201,372 in 1959, said that the tyre and other product costs were adversely affected by substantial rises in the prices of rubber and latex during the year. There was no significant compensating benefit from higher selling prices. Indications were that trading conditions in South Africa were showing some improvement in 1960, while prices of the company's products had been adjusted to more satisfactory levels. He reported that the modernization programme at the Durban factory was making good progress.

Selling to the States

The report that Pretoria Industrial Plastics (Pty.) Ltd. had received an order from the United States for a consignment of 70,000 pairs of plastics sandals is an indication, not only of the progress made by the South African plastics industry, but also of the great variety of purposes to which plastics can be put. There are about 30 firms in the Union which use predominantly plastics as raw materials as well as numerous others whose products include some plastics components.

One of the leading tyre manufacturers, for example, has organized a plastics section. Plastics are also used extensively by the paint industry, the cable manufacturing industry and the timber processing industry.

Profits Down

The 1959 report of the General Tire and Rubber Co. (S.A.) Ltd., an associate of the American company, states that the decline of taxed net profits from £113,466 to £80,286 has been due to the recession in the motor trade and higher rubber prices, while costs were increasing. Demand for natural rubber is still exceeding the supply. Greater use of synthetic rubber would, however, minimize the effects on the tyre industry. The Price Controller had agreed to price increases of from 5-7½% on passenger and truck tyres from January 1 1960. The current year should show an improvement on 1959. The dividend was reduced from 7½d. to 6d. a share.

New Division

The Goodyear Tyre and Rubber Co. (S.A.) Ltd. also reports reduced activity during the greater part of 1959, with the profit after taxation £307,322 against £433,409 in the previous year. A dividend of 20% was paid on the ordinary shares. There was only a nominal increase in the value of fixed assets during the year, but the company is now studying anticipated requirements for the next five years in line with the country's growth potentialities. Further improvements were effected in the quality of the tyres and other products. The company has created a new division called General Merchandise and Materials Control. In the four years from 1955 to 1959 South African sales of car and motor-cycle tyres increased by 158,739 and truck tyres by 31,078, and tractor tyres by 10,129, the total for the company in 1959 being respectively 947,593; 294,620 and 92,389. Hosing, conveyor belting and many other industrial items are also being provided by the company for mining and other use.

Foam for a Country

An important British producer of foam rubber is reported to have acquired an interest in a large Bulawayo, Southern Rhodesia, company which produces similar products. Major expansion is planned, the company's aim being to supply the entire latex-foam requirements of the Federation of Rhodesia and Nyasaland, with a surplus for export.

Car-Top Boat

South African Bonded Fibreglass, Prestige House, Alfred Street, Cape Town, among other types in fibreglass boats are making the Silverfish, described as a car-top runabout 10ft. long, designed with attractive flared bow, typical of deep-sea craft, combined with the flat planing surface of the speedboat. The bow is designed to keep the occupants dry in choppy seas and the flat planing surface enables fishermen to enjoy comparatively fast riding with light outboard motors. This boat is so small and light that it can be transported from point to point on a standard car-top carrier. It will accommodate four adults, and as it is well reinforced and has a wooden keel can be rowed.

New Film Grade

US Industrial Chemicals Co. have developed a polythene film grade resin that is said to produce a cast film of exceptional clarity, gloss and stiffness. Film made from the new resin, called petrothene 218, is recommended for a wide range of foodstuffs.

New Fumaric Acid Process

A NEW and simple fumaric acid process that offers excellent commercial possibilities for recovering fumaric values from almost any maleic containing feedstock was announced recently by Scientific Design Company Inc. of New York. The process can also be used for straight fumaric acid production from prime feedstocks such as benzene and butenes. The process employs a special catalyst, and is based on moderate isomerization conditions. Among the important maleic containing feedstocks that can be processed are maleic scrubber solution, phthalic scrubber solution, and maleic refiner bottoms. This process is of importance to maleic or phthalic anhydride producers as a means of utilizing waste product streams, and avoiding effluent problems by cleaning up residue streams. The process is a comparatively simple one, involves only readily obtainable equipment or chemicals, and results in high yields of fumaric acid which meets all commercial specifications.

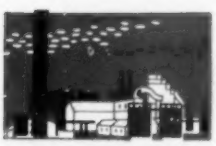
Fumaric acid is related chemically to maleic acid and maleic anhydride and behaves similarly in chemical reactions. It is, however, more stable at elevated temperatures. In polyester resins, the substitution of fumaric acid for maleic acid or maleic anhydride results in greater toughness and hardness, and increased heat resistance. Fumaric acid is also used in other moulding resins, in electrical insulating materials, elastomers, plasticizers, paper sizes, inks, household enamels, and adhesives.

Retreading in Kabul

The Afghan daily 'Islah' recently published an article on the activities at the Jungalak Industrial Plant in Kabul. It says that one of the best-equipped sections of the plant is the retreading and vulcanizing workshop for the reconditioning of old tubes and tyres. This section has machinery to retread old tyres and to repair more serious damage to the rims, and the inner fabric.

CONTINEX

HAF and ISAF



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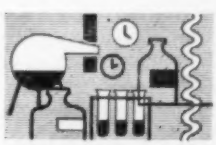

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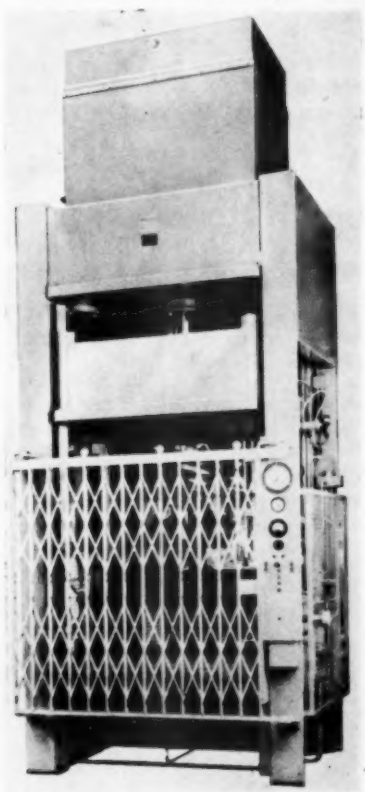
GRP Moulding Equipment

COMPLETE INSTALLATION FROM BIP ENGINEERING

WHEN the principle of matched-metal moulding became well established, it was a logical development that press plant engineers should design and introduce essential ancillary equipment. With this in mind, BIP Engineering Ltd. have added two new items of equipment—the Bipel Rotary Preformer and the Bipel Drying Oven. In conjunction with the company's 150-ton low pressure moulding machine, these items provide a complete installation for the glass reinforced plastics moulder.

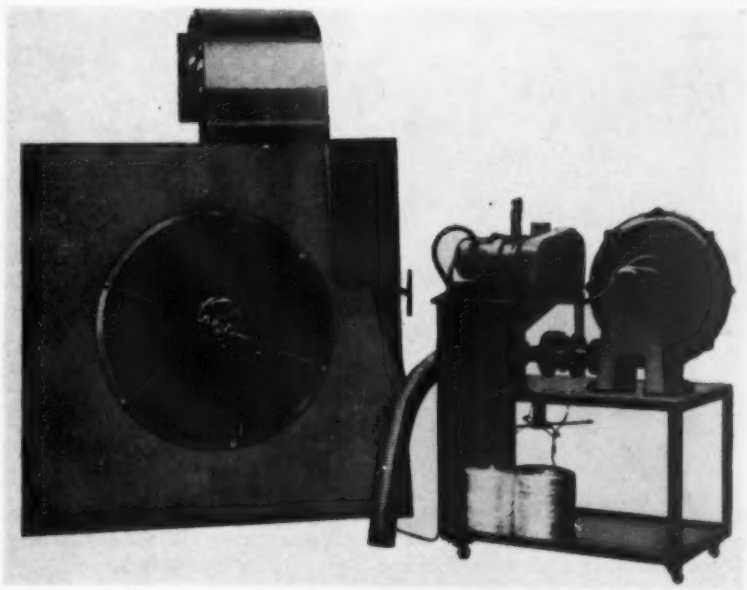
The Press

The 150-ton press has a platen area of 4ft. sq. It is therefore capable of applying 150lb. on each sq. in. of the mould area. The daylight of 72in. and stroke of 42in. are generous and the daylight is adjustable over 6in. steps; the normal minimum daylight of 30in. can be reduced by a ram



extension piece. A slide out bottom table, hydraulically operated, can be supplied if a very deep piece is to be moulded.

The normal opening force is sufficient for most purposes, but with a mould that is exceptionally difficult to part, short stroke adjustable jacks are supplied to boost parting effort to 75 tons. The press is supplied with three rates of closure, all adjustable for fine speed control and distance, and the main closing force can be varied infinitely between 20 and 150 tons.



BIP are producing two models of this rotary preformer. They have table diameters of 36 and 48 sq. in., giving preform areas of 7 and 12½ sq. ft.

Bipel Rotary Preformers are simple in operation; intricate shapes can be made to fine tolerances by semi-skilled operators after a few minutes' instruction. There are two standard machines with tables inclined at 15° from the vertical and surrounded with sheet metal backing. The table diameters of the machines are 36in. and 48in., giving preform areas of 7 sq. ft. and 12.5 sq. ft. Each table is driven by suitable vee-belts through a reduction gearbox giving a fixed speed of 4rpm.

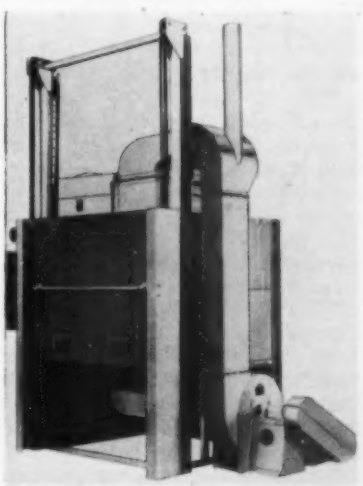
Drying Oven

The internal measurements of the preform drying oven are 3ft. 4in. square by 3ft. 6in. high for the 36in. preformer, and 4ft. 4in. by 4ft. 6in. for the 48in. machine.

The perforated internal base of the oven, which stands three feet from floor level, forms the mouth of the discharge ducting. This is fitted with a removal panel for cleaning purposes. The fan and 10hp motor used for the recirculation heating are positioned at floor level at the side of the oven. The discharge ducting from the base is fitted with an automatic 'By-pass' damper control connected to the 40kw heater, which is situated in the top of the oven, to reduce heat losses to a minimum. There is a double lining in 16 gauge steel.

The fan is capable of handling 4,400 cu. ft. of air per minute at 6in. swg. when running at a speed of 1,460rpm.

A heat-ray 30kw heater is provided with all the necessary temperature control equipment, and safety devices ensure that, on opening the door, the hot air is by-passed by means of exterior ducting obviating a rush of air when the door is open.

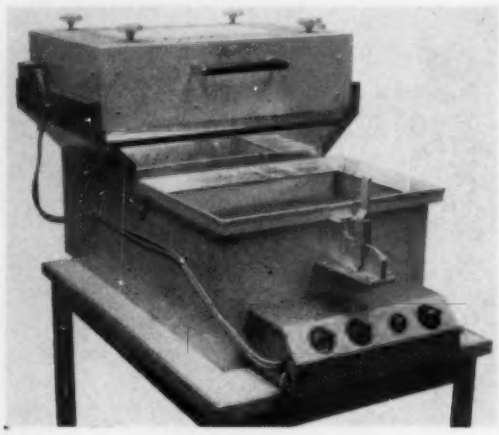


The drying oven is made in two sizes, to conform with the two models of preformer

Vacuum Forming

NEW RANGE OF SMALL MACHINES

THE plastics machinery division of Parnall and Sons Ltd., has recently announced the availability of a new range of four small table or bench - mounted vacuum forming machines. These machines are fitted with a specially designed high density heater of 3kW output, making them suitable for use with materials such as polypropylene, high density polythene and nylon, and they should prove useful for laboratory work as well as for small production lines.



One of a new range of vacuum formers, this Parnall machine, with its 3kW heater can be used with h.d. polythene, PVC and polypropylene

The most versatile machine in the range is the Parnavac SP4 which, in addition to skin and blister packing, is designed to execute normal drape forming on small areas and for thermo-covering with unsupported PVC materials.

The forming box is 17in. x 11in. and the drape is adjustable from 1in. to 5in. To ensure accurate heating times for each cycle, the machine is equipped with a timer control box containing mains switch, heater timer, pilot light indicating vacuum application and vacuum release switch. The heater timer is brought into action when the heater is pulled manually over the forming box. At the end of heating time a signal light glows to indicate expiration and the drape actuation is made by a simple hand operated lever. This automatically brings on the vacuum when the drape is lifted to the top of the stroke. Vacuum can be maintained for as long as necessary, until vacuum release button is pressed.

All the models have a built-in vacuum surge tank and the actual vacuum pump unit is connected by the flexible coupling, and can be located at any convenient position to suit individual requirements.

Alternative extras which can be fitted are: ceramic type infra-red heater; pneumatically operated drape table and guillotine shear incorporated in clamping frame.

NEED FOR NATURAL RUBBER RESEARCH

Research in natural rubber must be increased if the tree-grown material is to continue side by side with synthetic rubber as an important industrial commodity, Dr W. E. Cake, vice-president and co-ordinator of research, US Rubber Company, said last week in New York upon his appointment as the only American member of the newly-formed Co-ordinating Advisory Committee to the Malayan Rubber Fund Board.

'World capacity for the production of synthetic rubber is now for the first time greater than the production capacity for natural rubber,' Dr Cake stated.

'Thus the formation of the Advisory Committee comes at a particularly appropriate time.' Dr Cake pointed out that natural rubber research has become increasingly important with the advent of new types of synthetic rubber, such as polyisoprene and polybutadiene. These materials, he said, can replace natural rubber, either completely or partially, in products where the natural material has been required until now for quality reasons.

Mr Eric Potter has been appointed chief accountant of Pirelli. He replaces Mr H. E. Addington who has retired.

New Plastics Through Research

MAJOR plastics research conducted by various US Federal agencies with scientific research programmes is reviewed in *New Plastic Materials through Government Research*, published by the US Department of Commerce. The work of such agencies as the National Science Foundation, National Bureau of Standards, and the National Advisory Committee for Aeronautics is summarized, covering research programmes in both pure and applied science. Categories of plastic research reviewed include: irradiated plastics, mouldings, transparent materials, adhesives, coatings and fibres. There are also sections on sealants, foams, interlayers and honeycomb as well as laminates, specific plastics, inorganic and metallo-organic polymers, and silicones.

New Plastic Materials through Government Research, PB 161332, may be obtained from the Office of Technical Services, US Dept. of Commerce, Washington 25, D.C., price $2.25 or obtainable from *RJIP* Book Department.

Following negotiations within the Argentine-Uruguayan Joint Trade Committee, exchange surcharges have been abolished for the import into Argentina of some Uruguayan products, including tyres.

This anti-mist panel is produced by Key-Leather Co. Ltd. from BX Plastics Cobex rigid vinyl. A warm layer of air provides insulation and prevents condensation forming on either the panel or the window

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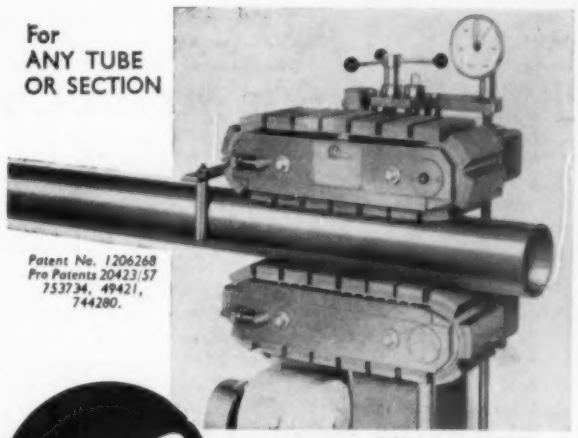

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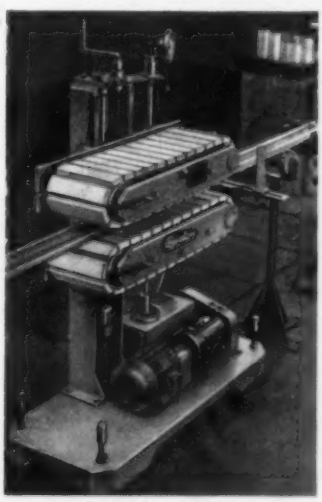

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IN MEMORIAM — P.S.

The Stress Strain Curve of Rubber

AN ALLEGORY BY W. B. WIEGAND

IN my first encounter with the SS curve of rubber I considered its dynamics, in my second, its thermodynamics; now, a look at its human dynamics. As I stretch this inner tube band to increasing elongations I ask that you divide each value by ten to reach the corresponding age of man. First, then, the early curve.

From zero to 300% — from birth to age 30 — increasing strains induce but minor stresses; the curve is mild, recovery from strain and stress is quick and complete, statistical probability — state of disorder — remains high. In rubber, as in life, the early curve is gentle, high in probability but low in structure, high in elasticity but low in useful energy — a time of gay and happy randomness! Next, the middle curve.

Now, I stretch the band from 300 to 600% — age 30 to 60. The curve has stiffened; like strains induce greater stresses; hysteresis is marked — the snap-back of youth gives way to the more sluggish recovery of middle age. Inner changes appear. Entropy and internal energy decline steeply, due to orientation, with thermal loss: the bodily heat of youth subsides. But a new property appears: the faculty of transforming heat into useful work. The middle curve is the region of the rubber heat engine. The middle years are the creative years, when the random ardours of youth are transmuted into orderly accomplishments, when there is more light, if less heat, more direction, if less motion. The middle curve, the middle years, are the most prolific, for rubber and for man. Finally, the later curve.

Now I am tugging hard — at 600% and beyond: age 60 and over. The curve is steep, almost sheer. Added strains may bring dangerous stresses. Recovery is slow and incomplete. Entropy and Internal Energy are touching bottom. Due to friction, the rubber pendulum will die down. Man, in his sixties, slows his pace. Productivity and statistical probability have fallen far. The outlook for the later curve looks grim. But wait! The X-ray shows that crystals have appeared which, in rubber, form the fibres of self-reinforcement. So, too, maturity brings crystallization of our beliefs. In rubber and in man order and alignment have replaced chaos and confusion. Linearity, plan, and pattern have appeared to bolster and reinforce. We have lost statistical probability, but, in its stead, we may have gained a vision of our ultimate destiny.

Our stress strain curve must terminate, but how? By rupture and failure, with broken pieces left behind? This must follow if we endlessly prolong our strains and stresses, forcing our curve beyond its natural course, striving to add, by antioxidants or antibiotics, another inch, or year.

> 'Pass then through this little space of time comformably to Nature, and end thy journey in content, just as an olive falls when it is ripe, blessing Nature, who produced it, and thanking the tree on which it grew.'

Shall we not also — following the fifth Antonine — be wiser to relax our iron grip, and, at our appointed time, release and let go our stress-strain curve, ready and prepared for a confident, resilient leap — like yours, dear Philip — into the Great Beyond?

This tribute to Dr Philip Schidrowitz by Dr W. B. Wiegand appears in the July 1960 issue of 'Rubber World.' We are indebted to the Editor of 'Rubber World' for permission to print it concurrently.

BRPRA Symposium

FUNDAMENTALS OF FAILURE PHENOMENA

DR L. BATEMAN, Director of British Rubber Producers' Research Association, opening the symposium held at the association's laboratories at Welwyn Garden City on July 7 and 8, said that the subject for discussion, which had long been recognized as one of the most important to the industry, was assuming a new significance. An era was upon us, he said, where the manufacturer would be able, and indeed would be obliged, to exercise greater selectivity in his choice of a rubber for any given application — and in making this choice, a sound appreciation of the distinctive service characteristics of different rubbers would be called for.

Evaluation of the new rubbers had already shown that their physical and technological properties did not conform to the same pattern of relationships as those associated with the older rubbers, and this had served to stimulate a more searching enquiry into the basic factors which determined these properties. The immediate outcome of any such enquiry was to re-emphasize how little was known not only about these factors but, more surprisingly and more pointedly, about the actual nature of properties such as strength, tear and wear.

The BRPRA had for years devoted effort to this general problem and had opened up new and revealing paths to the understanding of the above fundamental properties. They could not pretend that solutions to many of the pressing practical problems were thereby at hand, but a significant impact had certainly been made.

The rubber whose interests they served, natural rubber, or perhaps, said Dr Bateman, one should say 'real natural rubber,' occupied a special position in the elastomer family. It possessed an extraordinary balance of physical properties, as deeper study continued to highlight, and recent developments had greatly mitigated certain limitations imposed by its chemical reactivity. It was unquestionably the premier general purpose elastomer. However, while it was virtually certain to be used in increasing absolute amount in the future, it would necessarily be used in decreasing relative amount. Further selectivity in its use was inevitable and hence defining and ensuring its most advantageous, efficient and economical use was clearly to the benefit of producer and consumer alike. Certainly, the Government and producing industry in Malaya, in the substantial research effort they supported, had shown their awareness of this situation and of its relevance to the prosperity of the natural rubber industry and thus to the whole well-being of South-East Asia.

Dr Bateman concluded by saying: 'In introducing you to the work to be described, and on which we look

forward to your comments and criticisms, I should like to express the hope that you may be helped to view some of your problems in a new and fruitful light and that still closer bonds between industry and the BRPRA may be established.'

The talks (summaries of which appeared in *RJIP* July 9, 58) were entitled: 'Basic Factors Determining Tear Resistance,' by L. Mullins, Ph.D. 'Rupture Processes During Cut-growth and Flex-cracking,' by A. G. Thomas, M.A. 'Fatigue as a Cut-growth Phenomenon,' by P. B. Lindley, B.Eng. 'Stress Relaxation Studies of Oxidative Ageing,' by J. R. Dunn, D.Phil. 'New Approaches to the Protection of NR Against Oxidative Ageing,' by S. G. Fogg, B.Sc. 'Mechanics of Ozone Cracking,' by A. Gent, Ph.D. 'Physical Aspects of Antiozonant Functions,' by M. Braden, B.Sc., and D. Barnard, Ph.D.

It was rather surprising that, despite the high quality of the lecturing and the excellent manner in which the subjects under discussion were presented, more comment was not provoked. This presumably was because the lectures were based on the results of research into the basic fundamentals of elastomeric properties, and while these obviously have effects of vital importance to manufacturers, they are normally more concerned with finding methods of overcoming particular problems than with the fundamental reasons for the efficacy of those methods. Nevertheless the work being done at BRPRA is of tremendous value, and should provide a basis for the fuller understanding of the properties and limitations of natural rubber, and hence make simpler the methods of compounding and processing rubbers to meet particular requirements as economically and advantageously as possible.

It was announced that, as one outcome of the re-orientation of the several research and development units under the control of the Malayan Rubber Fund, the name of the BRPRA would shortly be changed to the Natural Rubber Producers Research Association, and that of the NRDB to the Natural Rubber Bureau. The Chairman and Principal Executive Officer of the MRF Board is the Controller of Rubber Research, a post recently assumed by Sir Geoffrey Clay, K.C.M.G., O.B.E., M.C., who was present for part of the symposium.

Redland-Ingram Purchase

Redland Holdings has purchased all the issued capital of J. G. Ingram and Son for £90,000. Ingram's business will be combined with that of Redland's recently acquired subsidiary, Tuck and Co., at the factory at Hainault.

BRPRA SYMPOSIUM

1—Dr A. Schallamach (BRPRA), Dr P. D. Brass (US Rubber Co.), J. Rogerson (BICC). 2—E. A. Murphy (Dunlop), R. Axe (Dunlop), D. Bulgin (Dunlop), Dr J. I. Cuneen (BRPRA), E. W. Madge (Dunlop). 3—Miss J. M. Mensing (J. G. Franklin & Sons Ltd.), Miss S. Popovic (Blue Peter Retreads Ltd.). 4—Mlle M. Boucher and Mme Y. de Merlier (Institut Francais du Caoutchouc). 5—Dr E. G. Cockbain and Dr L. Mullins (BRPRA), Dr W. C. Wake (RABRM). 6—E. W. Madge, E. Jago (Deputy Chairman, NRDB), Dr L. Bateman (BRPRA), Sir Geoffrey Clay (Chairman, MRF Board), P. O. Wickens (BRPRA). 7—A. F. Robinson (Nat. Coll. Rubber Technology), C. E. Taylor and R. C. Madan (Firestone). 8—S. C. Stokes (Rubber Technical Developments Ltd.), Dr C. M. Blow (Precision Rubbers Ltd). 9—E. Leeman (Internationales Kautschukburo), H. G. Morris (NRDB). 10—H. G. Rodway (NRDB), Sir Geoffrey Clay

The Technion—Israel Institute of Technology—on the slopes of Mount Carmel, 600ft. above Haifa. Since this photograph was taken the complex has increased considerably in size

Rubber Research in Israel

Third of a series of articles published from time to time on the work of organizations carrying out research for the rubber and plastics industries.

FROM the point of view of size and equipment the Rubber Research Association of Israel is in a somewhat different category from any of those research establishments which have been described in previous *RJIP* articles. Its director, Dr Z. Rigbi, is a man of 42 who obtained his first degree at London University in 1938 and was afterwards with I.C.I. Plastics Department for a number of years. Back in the country of his origin after war service, he was appointed to the Research Council (a Government body comparable to DSIR), and was instrumental in founding the Rubber Research Association in 1952. In 1958 with the aid of funds donated from USA the association, previously housed in a converted warehouse at Haifa, moved to Technion City.

Important Role

The Technion—the Israel Institute of Technology—plays an important role in the development of Israel's industrial and economic potential. It is the country's main source of engineers, architects, technologists and trained technicians, with ten faculties or departments for science and technology and architecture. Its group of modern buildings, which are now gradually being transferred from a congested position in the city, enjoy one of the most magnificent situations in any country in the world: a 300-acre site on the slopes of Mount Carmel, some 600ft. high above the busy Port of Haifa. The Rubber Research Association which is not, of course, a part of Technion proper, has been permitted to occupy one of the first buildings to be erected, on the basis of a certain measure of co-operation with the Institute.

The association receives no financial support from the Israel Government and is dependent for its funds on the local manufacturing industry. With a staff of three and laboratories occupying only some 1,400 sq. ft. of space its budget is a mere I£38,000 (£7,600) in the coming year. Its library is small and lacking in a large number of the standard scientific and technical works. It has a membership of 36 rubber manufacturing concerns with subscriptions graded according to size. Of these 36, 12 employ fewer than six workers, both of the two largest being tyre manufacturers. It is governed by a council of 13 elected at the annual general meeting, with an executive board of three council members meeting weekly at the association. Subject to the guidance on policy of his board and council Dr Rigbi has full responsibility and control.

It will be appreciated that a body of minimum size and finances such as this one is unlikely to wield much influence in the affairs of the Israeli rubber industry, nor will it be equipped to do much more than answer enquiries and solve minor technical problems. But by some miracle of energy and enthusiasm it is already playing a role of some importance. Its routine work is testing and the investigation of problems brought to it by the local industry. It allocates four hours' work a month gratis to each of its members and will charge a nominal sum for any additional work undertaken. But over and above this, it is permitted by its Articles to do any 'contract' work for Government departments or organizations which does not run contrary to its members' interests.

Varied Research

Most of the investigations it has undertaken to date in this way have not only enlarged the association's experience but have also helped its finances. Investigations carried through with success in recent years whether for industry or for Government organizations include work on local road bitumens and whitings and, with the active help of Rubber Technical Developments, on railway sleeper pads: a quarter million of which have been supplied by the industry to date. A problem of great local interest which fell to Dr Rigbi's lot to solve arose when the new French-built underground cable railway which runs some 1.8km. across Haifa to the top of Mount Carmel, operating on the funicula principle, reported excessive wear on the terminal drums round which the

Unique idea becomes successful product with PLIOLITE LATEX

Unique in concept and construction is the best way to describe the handsome floor covering pictured above. The idea is to use it first as temporary carpeting, later as permanent padding under conventional carpeting. It's made of colourful, durable open-weave cotton, permanently bonded to long-lasting foam rubber. The price—surprisingly low!

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cables pass at the end of their journey. This problem, like other specialized problems, had to be solved on the spot since foreign currency would not be available to transport the drums overseas, even if there had been time to send the parts back for servicing.

Some of the association's own developments are obviously worthy of greater resources and more substantial financing. These include the development of a very practical soft rubber compound, white or coloured, containing only 20% neoprene, which has proved highly resistant to atmospheric cracking, and which is now widely used in Israel for electrical couplings.

Old and New

The association within its limited budget has pursued the policy of obtaining what it considers to be the best laboratory equipment available irrespective of the country of origin.

Dr Z. Rigbi (*left*)**, head of the rubber research association, studying the mixing of a silica-loaded compound**

It rejoices in the original Bridge mill and calender, built in 1913 and bought for it by Dr H. J. Stern from RABRM when it moved from Croydon, and has just purchased a small extruder from Britain. There is also a modern American mill and other equipment including a Scott tester and a Firestone plastometer. It has other test equipment and an abrader from Germany and the United States. So far as new raw materials are concerned, in a country where foreign currency is subjected to the strictest control, all applications for import licences even of experimental quantities have to be closely scrutinized, but it manages to cover a fairly wide field with the help of one or two generous suppliers.

As a result of advice given some years ago by the Weizmann Institute, the Israeli Government ruled that the association must confine its activities to rubber and leave plastics developments to other bodies. This split is an unfortunate—and illogical—one for a body which had planned to deal with high polymers as a whole, and it is becoming more and more impracticable for the association to limit its investigations to natural and synthetic rubbers.

Raw Materials

The Israeli rubber industry buys its natural rubber on the London rubber market, but prefers to purchase its synthetics from North America, Germany or Italy, as it finds the technical services afforded by sales departments in those countries more helpful than those of their British competitors. Similarly it buys American carbon blacks. Chemicals such as antioxidants and accelerators come from Britain or Germany, belting textiles from Germany and the USA, with the exception of rayon which it can now obtain from the new plant at Ashkelon. Zinc oxide, clays, oils and factice are produced locally.

The industry is equipped to turn out a wide range of industrial and consumer goods and produced approximately 14,000 tons of tyres in 1959. Tyre output is rising rapidly, with a buoyant export trade. In April of this year a trade agreement with Turkey was concluded which allocated the largest of its quotas——$2.5m.—to tyres. (The two largest tyre manufacturers—the Samson and Alliance companies—are roughly 50% owned by United States interests.) Exports of rubber manufactures including tyres from Israel in 1950 were worth I£134, in 1954 I£831,917, and in 1959 I£12,192,038.

The Rubber Research Association in Israel is the creation of one able and energetic man, on whose skill its efficient administration, part of its technical work, and all its information services depend. As such it is vulnerable, and it is clear that to develop into a self-reliant organization and to extend its equipment, library and staff as they should be extended it should receive a greater measure of support from the local industry.

There is no doubt, too, that we in the West could help Dr Rigbi in his isolated situation by a greater readiness to co-operate with him in his everyday technical and supply problems. From the point of view of the British supplier of raw materials and equipment the expanding Israeli rubber industry is a market worth cultivating.

Worthington Cup

IRI GOLF

THE London Section of the IRIGS met at Ashridge Golf Club on Tuesday July 5 to compete for the Worthington Cup. In a day marred by intermittent rain the trophy was won by H. H. Marshall with 37 points. The runner-up, L. V. Jennings, also had 37 points, but lost on the last nine holes.

For those who were able to play two rounds, there was a four-ball better ball Stableford competition in the afternoon.

The next meeting of the London Section is to take place at Worplesdon on September 22. It is an invitation meeting, and the main prize will be the Sorbo Bowl.—C. D. S.

New Synthetic Rubber Venture

A company to manufacture polybutadiene and polyisoprene synthetic rubber has been formed as a joint venture by the Stauffer Chemical Company, New York, and the American Synthetic Rubber Company of Louisville, Kentucky, to be known as the American Rubber and Chemical Company.

The new company has obtained a licence for the processes to be used from the Phillips Petroleum Company. Construction of the production facility will begin at once and completion is scheduled for September 1961. Initial capacity will be 30,000 long tons of these synthetic rubbers annually. However, the plant will be so designed that, with minor modifications, output can be raised to 50,000 long tons per year.

Mr F. W. Harper has been elected chairman of United Serdang (Sumatra) Rubber Plantations.

MEN and MATTERS

A Review of People and Events

BAKELITE announce that James A. Wordingham has been appointed sales promotion manager for Warerite Products. Mr. Wordingham has had a wide experience as a newspaperman and publicity executive. He started his career as a reporter with the old Kemsley Press, on the staff of the *Daily Sketch* and *Sunday Graphic*. During the war he served in the Royal Artillery, being attached for most of his service to the Army Education Corps. He has been editor of the *Norfolk Chronicle* (for five years), and publicity manager of Hobbies Ltd.

He joined Bakelite Ltd. six years ago and was appointed assistant publicity manager in 1957.

New ASTM President

Elected president of the American Society for Testing Materials at the 63rd annual meeting, June 28, was Dr A. Allan Bates of the Portland Cement Association, Chicago. He has been a member of ASTM since 1946 and will serve for one year from the date of the meeting.

Among the new members of the board of directors of ASTM, elected for three-year terms, was Leslie V. Cooper, manager of the Miscellaneous Products Development department of the Firestone Tire and Rubber Company, who has served on ASTM committee D-11 on rubber and rubber-like materials since 1935. He is currently serving on the D-11 advisory committee and is also that committee's representative on ASTM committees D-20, plastics, and E-1, methods of testing. He is chairman of the finance committee of the rubber division of the American Chemical Society.

Another new board member hails from England. He is Robert F. Legget, director, division of building research, National Research Council, Ottawa. Mr Legget, a native of Liverpool, was educated at Liverpool University and received his Master's degree in 1927. He moved to Canada in 1929; is a member of the American Society of Civil Engineers and the Engineering Institute of Canada.

Tyres Like Dad's

It's not very often that a rubber company goes into business to make the vehicles on which its tyres are

by Peter Richards

used, but Firestone of Akron are doing so.

This company is marketing a fun kart for the youngsters. Karts are becoming all the rage in America: there is go-kart racing, a Go-Kart Club of America and an American Kart Manufacturer's Association. This model for youngsters looks like a sledge with a small outboard motor on the back. Speeds range from 4-6 up to 12mph. One model is known as a trainer, and is recommended to teach the budding motorist good driving habits.

An interesting point is that the American youngster can now have 'tyres just like dad.' Firestone say that the specifications feature nylon cord and race tyre construction patterned on the same principles as their race tyres used by professional racing drivers. The only thing is—will the youngster also develop some of the motorist's undesirable habits? When he goes a few yards round the coner to the candy store, will be take the fun kart? Will he, in fact, develop a spare tyre just like dad's?

Pioneer Highway

Included in the news items which reach us from far-away places, often sent by readers of *RJIP*, is a story of the new 151-Km. highway connecting Banmethout and Ninh Hca, through sparsely-populated highland country in Central Viet-Nam. This has opened up new lands and opportunities to pioneers willing and capable of converting wild forests into productive farms. Ten thousand volunteers have already been attracted, and another 15,000 will enter the area this year. Rubber is among the plants which grow readily in the highland area.

Smoke Research

Nothing to do with rubber or plastics but eminently reportable, in my opinion, is a recent bit of research work carried out by *Which* into the performance of cookers of the type used on picnics. Using a special type of cooker which can burn 'flammable rubbish,' *Which* research workers turned — I can hardly add 'naturally' — to national daily newspapers for fuel. They noted the time taken, the number of double sheets used and

Mr E. K. Cole, C.B.E., chairman and managing director of E. K. Cole Ltd., presented gold watches to seven Ekco employees at a ceremony in the Ekco Clubhouse on July 7 to mark their completion of 25 years' service with the Company. These latest recruits to the Ekco '25' Club, seen here with Mr Cole, are *(left to right)*: **Back row: F. A. Jeffrey (Plastics Presses), E. R. Barrs (Radio Sales), T. H. Woodward (Plastics Presses), L. A. Shaw (Administration), L. A. Clark (Final Test and Inspection). Front row: Miss H. E. Farrow (Coil Winding), E. K. Cole, T. A. Daniels (Tool Design)**

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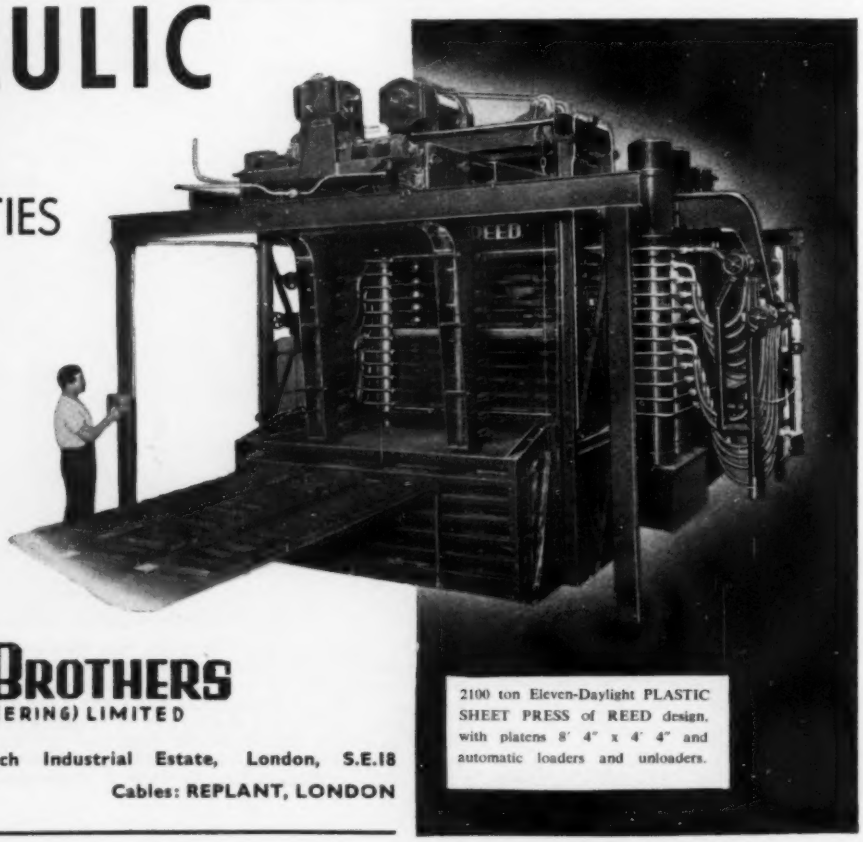

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the amount of smoke produced in boiling three pints of water.

The results are fascinating. Taking the longest time, using the most double sheets but producing least smoke, described as 'extremely little' was *Which* itself. Hottest, obviously, was the *Daily Worker* which took five minutes and seven double sheets. It shared smoke position with the *Telegraph* and the *Herald* in giving 'very little smoke.' Oddly enough, the *Telegraph* was the most flammable, no more than four and a half double sheets being needed as against seven for the *Worker* and five for *The Times*. Qualifying for the category 'dense smoke' were the *Express*, the *Mail*, the *Mirror* and the *News Chronicle* but, in this connexion, they were eclipsed by the *Financial Times* which had the group 'very dense smoke' all to itself.

One wonders whether *Which* was not perhaps a little wet when the experiments were carried out.

Handy

The development of an artificial hand was described in Moscow recently at the conference of the International Federation of Automatic Control. The device, according to a *Financial Times* report has been constructed from a human bone skeleton with elastic bands to open the hand in a relaxed position and wires operated by an electrical solenoid to close it.

This construction is enclosed in a rubber glove filled with sponge impregnated with carbon granules. A 'sensing' current is produced proportional to gripping pressure and area and this 'sensing' is fed back to the operating solenoid to limit the gripping pressure. The device is sensitive enough to hold a delicate wine glass.

Further developments are being made to give individual finger control. It is thought that the device will be of great significance to designers of automation equipment and that it may offer the prospect of greatly improved limbs for the maimed.

Reed Expand

Expansion in expanding industries would seem to come naturally, but this is not by any means necessarily the case. However, one company whose policy is proceeding vigorously outwards is Reed Brothers, the Woolwich, London, engineering firm. Their products include heavy hydraulic and rubber and plastics machinery, and also new types such as the Reed-Lombard drawbench.

Liaison with customers, sometimes known as technical service, is an essential part of such expansion and Reed Brothers have recently increased their sales force with this end in view. The team is led by Mr K. R. Boreham as general sales manager and includes Mr G. Fenton, Northern Area representative; Mr D. W. Hodgkiss, Midlands Area; Mr J. E. Spellar, London and Home Counties and Mr F. G. O'Hagan, Scotland. Mr Fenton and Mr O'Hagan have represented the company in their respective areas for a number of years.

The sales force of Reed Brothers (Engineering) Ltd. has recently been increased to parallel the Company's expansion (see news item on this page). Pictured above *(left to right)* **are K. R. Boreham, G. Fenton, D. W. Hodgkiss and J. E. Spellar**

Question Corner — 126

(Second Series)

451. What are some of the factors that need to be considered in the blown film extrusion of polythene?

(Answer next week)

Answer to Question Corner — 125

450. In a heat sealing machine the film is welded to itself by means of both heat and pressure. There are many types of commercial heat sealing devices but most of them operate on the same principle. The heater bar sealer is most commonly used, and the sealing takes place between the electrically heated bar and a stationary base.

In the electric jaw-type heat sealer the bar, by means of a foot switch, can be moved downward so as to exert a pressure on the pieces of film which are held together and placed between the sealing bar and the base.

In some cases—for instance with polythene—to prevent the molten thermoplastic material from sticking to the hot bar a layer of Teflon-coated glass cloth is used as a separating barrier between the sealing bar and the film.

In addition to the comparatively simple jaw-type heat sealer, there are rotary sealers designed for continuous operation. These machines operate by passing the film over a revolving drum which acts as the base for the sealing bar to press against.

Both sealing temperature and pressure must be fixed and regulated with care and, generally, too low a temperature, or pressure, or too short a clamp time will result in an indifferent bond. On the other hand, too high a temperature, or pressure, may force the resin from between the jaws, resulting in a thin and weak seal.

(Another question next week)

Polly Ester Says . . .

'Hopper capacity — the crowd at the Palais on Saturday night'

Indonesia Association

LONDON MEETING

AT the ninth annual general meeting of the Indonesia Association, held in London on July 8, Mr R. G. MacIndoe, chairman, said that during the year under review the Association had continued to maintain its accustomed good relations with their associates in Indonesia, the British Chamber of Commerce in Djakarta, and he recorded sincere appreciation of their efforts on behalf of the British business community operating in that country.

After referring to the election to honorary membership of three former council members, Sir John Hobhouse, Mr A. L. Mathewson and Mr F. H. Sargent, who had rendered outstanding service to the Association from its early beginning, Mr MacIndoe referred to the fact that British estates in Indonesia continued in some areas to work under difficulty owing to the activities of marauding bands. However, though it could not yet be said that the security situation had definitely improved, the local authorities, including the military, had the matter in hand and they consequently looked forward to the firm re-establishment of law and order in all parts of the country where it did not at present always prevail.

At the same time, owners would no doubt welcome more positive progress with the Government's basic agrarian legislation, so that the declared policy of granting new titles of at least 30 years' duration to efficiently operated estates may be steadily implemented. While many estates were embarking on considerable replanting programmes, they could hardly be expected to undertake a desirable measure of rejuvenation on their properties with zeal and enthusiasm while they were still kept in suspense regarding the renewal of their titles. Incidentally, said the chairman, Government legislation blocking 90% of companies' balances seriously reduced the funds available for carrying out replanting programmes, and difficulties and delays encountered in the importation of estates' supplies had further added to the problems of those members who were endeavouring to carry out progressive programmes.

Mr MacIndoe went on to say that this was the last occasion on which he would address them as chairman of the Association. They had done him the honour of keeping him in the chair since the Association was incorporated on January 29 1951. They had set out to have their Association recognized as the forum from which the united views of British interests in Indonesia could be given publicity and that they had undoubtedly accomplished. They had seen to it that their views on all important matters affecting British interests in Indonesia were known where they ought to be known. There was, therefore, no reason to be depressed because they had not yet achieved the millennium and still had many difficulties which they would like to see removed.

Mr MacIndoe concluded by saying he wished to put on record how much he had appreciated and enjoyed being their chairman for so long. A vote of thanks proposed by Mr C. Jackson was seconded by Mr F. W. Harper.

Extrusion Colours

IN May 1959 Bakelite Ltd. introduced Vybak Colourmix Compound DVN. 770, which provided a convenient system for obtaining a wide range of the colours used in general purpose PVC extrusion work. This system has met with considerable success and as a result the range has been extended by introducing Compounds DVN. 660 and DVN. 880 having a BS softness of approximately 60 and 20 respectively.

With DVN. 660 and DNN. 880 the same method of operation used with DVN. 770 is applied. The compounds are supplied in natural and a limited number of basic colours only. Combinations of the basic colours can be blended by the user prior to extrusion to give a resultant product of the required colour. The proportions required to obtain a particular colour are essentially the same for all the Colourmix Compounds.

The system provides an immediate advantage to general purpose extruders whose work often entails the use of a wide variety of colours. By using DVN. 660, DVN. 770 and DVN. 880 only a limited number of colours need to be kept in stock and urgent requirements for new colours can be completed with a minimum of delay.

Vybak Colourmix Compounds DVN. 660 and DVN. 880 are supplied in natural, black and the following seven basic colours: blue, brown, cream, green, red, white, yellow.

The light stability of the basic colours is good and meets cloth 5 when tested outdoors to BS 1006. Pigmentation of the individual basic colours has been designed to give balanced blending when mixed, *i.e.*, there is no colour of sufficient strength to blanket the effect of mixing with other colours. Mixtures in any combination can be used, though it is recommended that not less than 2.0% of any one colour is used as this may give rise to problems of non-uniform blending and subsequent dispersion during extrusion.

DVN. 660 and DVN. 880 Natural 6 can be extruded with the Vybak range of colour masterbatches DVZ. 403 to produce the colours matching the cable colours to BS 2746: 1956 standards. On efficient extruders it may prove possible to interblend Vybak Colourmix Compounds DVN. 660 or DVN. 880 with DVN. 770 to produce extrusion of intermediate BS softness. It is recommended that a simple experiment as a check is, however, carried out before attempting manufacture. Blending can be carried out in a tumbler mixer or other suitable blending equipment. Properties of the new compounds are given in the table. Test methods used to establish these were as laid down in BS 2782.

	Dvn. 660	Dvn. 880
Mech. Properties:		
Tensile strength (lb./sq. in.) min.	1,900	3,000
Elongation at break (%) min. ..	350	220
100% modulus (lb./sq. in.) min.	500	2,200
Electrical properties:		
Vol. resistivity 23°C (ohm cm.) min.	1×10^{12}	3×10^{13}
Vol. resistivity 60°C (ohm cm.) min.	5×10^{9}	5×10^{11}
Other properties:		
Cold bend temp. (°C) max. ..	—35	—25
Cold flex temp. (°C) max. ..	—25	+1
Loss on heating (%) max. ..	1.5	1.5
Water absorption (mg.) max. ..	30	30
Water sol. matter (mg.) max. ..	5	1
Specific gravity approx. ..	1.375	1.420

Palmer Aero Products Ltd. have been awarded a large contract to supply three types of 'tailor made' filters for use on the English Electric Lightning.

Rubber Statistics

WESTERN GERMANY — JAPAN — SOLE CREPE

THE Secretariat of the International Study Group has now published details of the West German rubber position up to the end of February last.

Western Germany

Imports of natural rubber during these two months totalled 31,781 tons, and included 2,381 tons of natural latex; this represented an increase of more than 9,000 tons compared with the similar period of last year. Imports from Malaya increased by more than 10,000 tons, to show a figure of 21,471 tons, but imports from Indonesia dropped from 3,485 tons to 1,951 tons. Other countries sending their rubber to Western Germany included Ceylon (1,033 tons), Vietnam (2,502 tons), and Nigeria (2,261 tons). After allowing for exports of 166 tons, there remained a new supply of 31,615 tons, compared with 22,230 tons a year previously.

Consumption of natural rubber during this period amounted to 24,098 tons and included 2,265 tons of latex; this total was barely more than the total for the first two months of 1959, at 23,850 tons. It was natural, therefore, that stocks should have risen considerably, having begun the year at 14,269 tons and standing at 20,017 tons at the end of February.

Home production of synthetic rubber amounted to 11,746 tons, nearly three times the previous year's figure to the end of February of 4,344 tons. In addition, there were imports of 5,827 tons from the USA, 873 tons from Canada and 817 tons from Italy, which, with 566 tons imported from other sources, brought the total up to 8,083 tons, an increase of nearly 3,000 tons over the earlier period. After allowing for exports of 2,963 tons, there remained a new supply available for consumption of 16,866 tons, against which the actual consumption figure was 15,524 tons; this represented a 50% increase compared with the 1959 figure of 10,119 tons. Stocks of synthetic at the end of February stood at 10,963 tons, having risen to this figure from the previous year's level of only 5,414 tons.

Production of reclaim rubber during these two months amounted to 7,919 tons, rather more than 1,000 tons above the 1959 figure, and after allowing for imports of 156 tons and exports of 597 tons, there remained a new supply of 7,478 tons. Consumption of reclaim amounted to 7,834 tons, an increase of some 1,300 tons compared with the previous year, and stocks of reclaim at the end of February stood at 3,670 tons, having amounted to 4,026 tons at the commencement of the year.

Japan

The latest figures published by the Study Group in the case of Japan bring the position up to the end of January.

Imports of natural rubber during the month totalled 15,972 tons, compared with little more than 11,000 tons in January 1959. They came mainly from Malaya (10,471 tons), but smaller quantities were also received from Thailand (2,711 tons), and British North Borneo (1,179 tons). There were no exports of natural rubber, and consumption totalled 12,210 tons compared with 10,790 tons the year before. Stocks of natural on hand at the end of the month amounted to 17,745 tons, having risen by nearly 4,000 tons since the beginning of the year.

Imports of synthetic rubber during January totalled 2,601 tons, of which 1,990 tons came from the USA and 581 tons from Canada; this was some 700 tons more than the year before. Consumption of synthetic totalled 3,940 tons as against 1,590 tons, nearly two-and-a-half times as much, while stocks at the end of the month stood at 8,508 tons compared with stocks of 9,847 tons with which Japan began the year.

Sole Crepe

According to figures recently released by the Study Group, sole crepe exports during April totalled 665 tons, bringing the total for the year so far to 3,293 tons. After the United Kingdom, which took 212 tons of this rubber, next in order of importance came Spain with 94 tons, Vietnam with 70 tons and France with 67 tons.

Ceylon's exports of sole crepe in April totalled a mere 22 tons, while Vietnam and Cambodia are both reported as having made no exports during this month.

Export Opportunities

Model Aircraft

Teras Oy., Hovioikeudenpuistikko 19, Vassa, Finland, would like to get in touch with UK manufacturers of plastics model aircraft and ship construction kits, which they wish to import.

Teras Oy., established in 1910, are a leading firm of hardware wholesalers and retailers and have branches or affiliated companies throughout Finland.

Manufacturers interested in this enquiry should write direct to the Finnish concern, also notifying the Commercial Department, British Embassy, 18 Etela Esplanaadikatu (6th Floor), Helsinki, that they have done so. (Ref. ESB/16757/60.)

Forestry Hose

William MacGillivray and Co. Ltd., 164 Water Street, St. John's Newfoundland, are seeking a source of supply in the UK for a complete line of forestry hose of all sizes and other rubber and fabric hose products and want suppliers to submit samples, particularly of forestry hose in the 2in. size, complete with couplings.

(Ref.: ESB/16402/60.)

Resins for Italy

The firm of Unicol di O., Canal of Via Olmie, 3, Mogliano Veneto (Treviso), have informed the Commercial Section of the British Consulate-General at Milan that they would like to represent United Kingdom manuturers of urea, phenolic, melamine and polyester resins.

Manufacturers interested in this agency enquiry should write direct to Unicol di O, and notify the Commercial Section, British Consulate-General, Via Gabba 1/A, Milan, that they have done so. (B.o.T. ref.: ESB 17504/60.)

Enquiries should be addressed to the Board of Trade, Export Services Branch, Theobalds Road, W.C.1, unless otherwise stated.

Book Review

MOTOR TRANSPORT COST TABLES. (Iliffe. 2s. 6d.)

This pocket book gives the latest cost of running all types of goods vehicles, including variations in drivers' wages and the cost of petrol and diesel fuel. The tables show the standing costs per year, per week and per hour; the running costs per mile, and the total charge per mile over a range of annual mileages for each size of vehicle, according to the part of the country in which it is based. Factors are included which enable the tables to be adjusted by the user to allow for future fluctuations in fuel prices.

As an aid to haulage contractors, the tables include an allowance for profit. Traders can therefore utilize the total charges given to check on rates quoted them by contractors. They can also deduct the profit allowance and use the resulting figures to check against the costs of the vehicles they operate themselves.

Also included is a fuel cost ready reckoner which gives the cost of fuel in pence per mile for all rates of consumption between 5mpg and 30mpg and for all prices of fuel from 3s. 6d. to 5s. 3d. in ¼d. steps.

∴ Copies may be ordered through the Books Department, RUBBER JOURNAL AND INTERNATIONAL PLASTICS, Maclaren House, 131 Great Suffolk Street, London, S.E.1.

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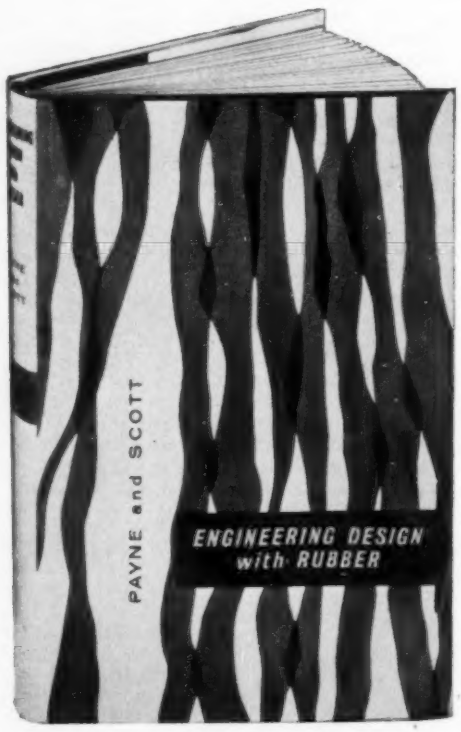

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PATENT SPECIFICATIONS

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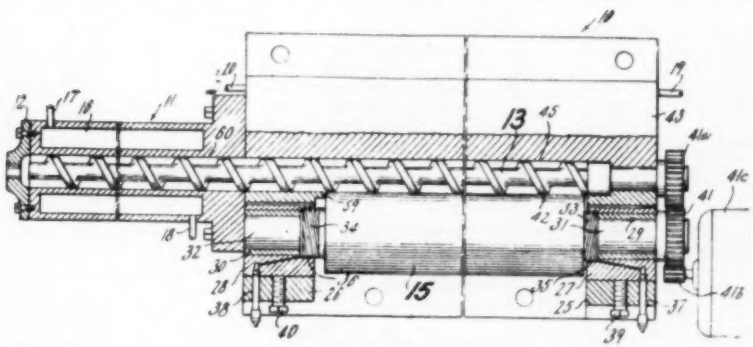
Extruder for Rubber Compounds

No. 828,914. United States Rubber Co. Application and Filed, March 29 1956. Application in USA, June 20 1955. Published, February 24 1960.

An extruder for rubber is so constructed that it is unnecessary to preheat the rubber on a warming mill prior to extrusion. The drawing is a plan view of the extruder with parts broken away and parts shown in section.

Instead of the usual small hopper for feeding the rubber stock to the screw of the extruder, a driven roll 15 is provided. The screw housing towards the feed end of the screw 13 is open for a considerable portion of the length of the screw, the driven roll being mounted beside the exposed portion of the screw. In operation, the screw 13 and the roll 15 are rotated towards each other, and the rubber stock, which need not be preheated on a warming mill, is thrown into the nip between the screw and the roll without any particular regard for quantity. The rubber forms a bank from which the screw continuously draws a proper amount and passes it through the enclosed portion of the screw to the extrusion die without any tendency to underfeed or to include air bubbles.



Suede-like Plastic Sheeting

No. 833,416. The General Tire and Rubber Co. Application and Filed, August 28 1958. Application in USA, August 29 1957. Published, April 21 1960.

A coating of a thermoplastic polymeric material containing a plasticizer and a blowing agent is applied to a fabric support and heated to form a cellular layer. The surface of the cellular layer is then abraded to produce a suede-like finish. The thermoplastic material may be applied by casting a plastisol composition or by calendering a sheet on the support.

The basis of the thermoplastic material is preferably PVC, polyvinylidene chloride, a copolymer of vinyl chloride and vinyl acetate or vinylidene chloride, or mixtures of these materials. Suitable plasticizers are high-boiling monomeric esters, ketones and ethers while long-chain linear polyesters may also be used. The blowing agents may be of any of those commonly used for making rubbery sponges.

Polythene Compositions

No. 829,148. United States Rubber Co. Application and Filed, June 28 1957. Application in USA, September 6 1956. Published, February 24 1960.

Cyclized natural rubber is blended with low-pressure polythene in a proportion of 5 to 50 parts of cyclized rubber to correspondingly 95 to 50 parts of the low-pressure polythene. Low-pressure polythene cannot be processed on conventional roll mills, internal mixers or calenders as it is too sticky at the temperatures of working in such equipment, but admixture of cyclized rubber with the polythene overcomes this difficulty and also improves the properties of the fabricated polythene. It is preferred to include also a small proportion of natural rubber in the composition, typically from 2 to 10 parts per 100 parts of the polythene-cyclized rubber mixture. Low-pressure polypropylene or other polyolefin may be used instead of polythene. Examples are given showing the effect of the addition of (a) cyclized rubber and (b) cyclized rubber and natural rubber on the calendering and other properties of low-pressure polythene. Sheets formed from compositions according to the invention can be vacuum formed or shaped with the aid of plugs or forms, in contrast to sheets formed from 100% low-pressure polythene which are unsuitable for such processes.

Crop Returns

Unless otherwise indicated the figures quoted, to the nearest thousand lb., represent crop returns for the month stated and for the number of months of the planting company's financial year to date. Corresponding figures are given in parentheses.

HARRISONS AND CROSFIELD

May

Allied Sumatra.—651 (626). 5 mths—3,526 (3,448).
Asahan.—82 (104). 10 mths—944 (1,162).
Bah Lias.—143 (128). 7 mths—1,058 (1,034).
Central Sumatra.—62 (68). 11 mths—769 (945).
Lankat Rubber.—66 (47). 2 mths—125 (100).
Mendaris.—139 (143). 5 mths—776 (818).
Namoe Tongan.—218 (207). 9 mths—2,122 (2,057).
Sialang.—177 (162). 4 mths—739 (711).
Soengei Rampah.—44 (42). 5 mths—218 (230).
Tanah Datar.—57 (55). 5 mths—303 (315).
Tandjong.—134 (118). 11 mths—1,659 (1,610).
Toerangie.—179 (146). 7 mths—1,338 (1,318).
United Lankat.—29 (26). 5 mths—150 (133).
United Serdang.—764 (669). 9 mths—7,762 (7,726).
London Asiatic.—1,556 (1,471). 5 mths—7,531 (7,030).
Oriental.—265 (253). 5 mths—1,252 (1,146).
Bukit Kajang.—112 (—). 5 mths—532 (—).
Lanadron.—434 (409). 5 mths—1,985 (1,919).
Pataling.—1,279 (1,207). 7 mths—9,002 (8,023).
Jugra Land and Carey.—368 (511). 7 mths—3,054 (3,245).
Golden Hope.—674 (722). 3 mths—1,925 (1,971).
New Crocodile.—214 (240). 3 mths—604 (637).
Castlefield.—250 (290). 11 mths—2,890 (2,634).
Holyrood.—79 (66). 5 mths—405 (334).
Hongkong.—32 (29). 5 mths—146 (131).
Hoscote.—259 (254). 11 mths—2,633 (2,640).
Killinghall.—45 (44). 11 mths—470 (476).
Kuala Selangor.—73 (67). 5 mths—315 (287).
Kulai.—188 (205). 7 mths—1,221 (1,407).
Malaysia.—58 (60). 5 mths—280 (249).
Prang Besar.—313 (262). 2 mths—594 (473).
Sandac.—67 (48). 2 mths—132 (93).
Seaport.—76 (72). 11 mths—790 (836).
Malayalam.—568 (694). 2 mths—1,509 (1,441).
Lunuva.—76 (99). 5 mths—469 (492).

SHARPE ESTALL

Anglo Johore.—39 (39). 10 mths—346 (338).
Bekoh CRE—193 (188). 2 mths—353 (352).
KPRP.—59 (65). 2 mths—104 (116).
Rim (Malacca) RE.—218 (199). 11 mths—2,456 (2,364).
Kurunegala.—25 (21). 5 mths—121 (109).
Sittang Valley.—56 (89). 11 mths—1,008 (1,212).

———

Batu Tiga.—164 (176).
Kuala Reman.—171.
Beau Sejour.—36 (37). 11 mths—587 (581).
Inch Kenneth Kajang.—218 (216). 5 mths—1,009 (959).

Rubber and Plastics Stock Market

A REVIEW OF PRICES AND TRENDS

SHARE prices have made slow but steady progress along recovery road during the past week or so. Some of the top line favourites like BAKELITE, BRITISH XYLONITE, COURTAULDS, DE LA RUE, I.C.I., and TURNER AND NEWALL, have especially been sorted out for investment support from both the big and small brigades whose interests centre around the Stock Exchange.

But although it appears that most folk have overcome the shock of Mr Amory's twin blockbusters and confidence to some degree has returned, a feeling of caution prevails. This plus the fact that the peak holiday season is fast approaching and three week trading periods follow one another, tends to keep business quiet. And at the time of writing it appears that a tug-o-war has developed between the 'gloomies' and those who remain impressed by the continued flow of brilliant company results disclosing substantially higher profits and dividends.

The directors of Courtaulds, widely tipped as the next company to follow I.C.I. on to the Paris Bourse, told shareholders that capital expenditure commitments of the group totted up to around the £8.75m. mark at March 31 last compared with only £2.8m. a year ago. As far as the company's chemical division is concerned it was said that major extensions of production are in hand. In addition it is also intended to intensify efforts in developing chemical production. The past year saw a marked increase in sales and a corresponding rise in profits. But there was the warning that competition is increasing and prices are expected to be generally lower.

Year end holdings of Government securities were higher at £20.95m. despite the year's substantial amount of investment. But it is anticipated there will be some reduction in the current year to finance the capital expenditure programmes. Combined amounts of tax reserve certificates, Treasury bills and cash increased by £2,500,000 to £11.90m.

Courtaulds still has some 70% of its net assets employed in the fibre industry and the scope for increasing its interests in such fields as plastics and chemicals makes them an attractive proposition even at today's high price levels.

There was a disappointment for those holding shares of BRITISH INDUSTRIAL PLASTICS. They announced that the merger negotiations referred to a little while ago had been discontinued, no agreement having been reached. The board, however,

Continued on page 105

Share Price Movements

Par Value	Company	1960 High	Low	July 2	Latest
£1	A.E. Ind. Ord.	67/-	50/3	53/-	51/6
5/-	Albright & W. Ord.	31/9	25/9	28/6	31/3
£1	" " " 5% Pref.	17/3	15/6	16/3	15/6
5/-	Anchor Chemical Ord.	18/7½	14/9	15/-	15/3
5/-	Andersons Rub. Ord.	—	—	3/1½	3/1½
£1	Angus Geo. Ord.	47/6	34/9	45/6	45/6
5/-	Ault & Wiborg Ord.	25/-	20/-	23/9	24/4½
£1	Avon India Rubber Ord.	46/6	35/-	35/-	35/6
£1	" " " 6% Pref.	20/-	17/6	18/9	18/9
10/-	Bakelite Ord.	61/9	39/9	57/6	61/9
£1	" 6% Pref.	19/-	16/9	19/-	19/-
£1	Baker Perkins Ord.	43/3	40/3xc	41/6xc	40/9xc
4/-	Bank Bdg. Rubber Ord.	3/9	2/3	2/3	3/7½
4/-	Brammer H. Ord.	18/3	16/9	18/3	18/6
10/-	Bridge, David Ord.	60/-	53/6	59/-	62/6
5/-	Bright, John Ord.	18/6	15/3	17/4½	17/3
5/-	Brit. Blting. & Asb. Ord.	—	—	—	17/3
£1	" " " Pref.	—	—	—	17/3
2/-	Brit. Ind. Plas. Ord.	10/6	5/3	11/4½	9/3
2/-	" 10% (tax free) Pref.	4/9	4/3	4/9	4/9
£1	British Xylonite Ord.	110/-	78/9	97/6	110/-
£1	" " 5% Pref.	17/6	15/-	16/6	16/-
£1	BICC Ord.	61/3	50/9	50/9	51/4½
5/-	BTR Ind. Ord.	16/6	9/9	14/3	16/6
£1	" " 7½% Pref.	24/3	23/-	23/6	23/9
£1	Courtaulds Ord.	70/7½	58/9	65/3xd	70/1½
£1	" 5% 1st Pref.	17/9	16/3	16/6	16/3
£1	" 6% 2nd Pref.	21/-	19/-	19/4½	19/-
4/-	Cow, P. B. Ord.	9/6	6/9	9/4½	9/4½
£1	" " 5% Pref.	15/6	14/9	15/-	15/-
1/-	Dannimac Mfg. Ord.	12/9	9/6	10/-	9/6
10/-	De La Rue Ord.	83/3	65/6	75/-xd	83/3
£1	" " " 3½% Pref.	12/-	10/9	10/9	10/9
10/-	Distillers Co. Ord.	39/9	32/9	35/9	38/7½
£1	" " 6% Pref.	22/-	19/6	20/6	19/6
£100	" 5% Conv. Loan	£96	£95½	£96	£94
£100	" 5½% Unsec. Loan	£97	£89	£89½	£89
10/-	Dunlop Rubber Ord.	28/3	21/9	25/6	26/3
£1	" " 5½% Pref.	19/-	16/9	17/6	16/9
£100	" 3½% 1st Debs.	£78	£68½	£75½	£68½
£100	" 4½% 2nd Debs.	£87	£85½	£85½	£85½
£1	Eng. Elect. Ord.	53/6	36/3	36/3	40/-
4/-	Ebonite Cont. Ord.	14/3	11/3	11/3	11/3
£1	English China Clays Ord.	95/-	74/6	85/6	87/6
£1	Goodyear Tyre 4% Pref.	12/9	11/6	11/9	11/3
5/-	Greeff Chem. Ord.	47/6	25/-xc	45/-	25/-xc
10/-	Greeff Chem. 5½% Pref.	9/-	8/6	9/-	8/9

Par Value	Company	1960 High	Low	July 2	Latest
5/-	Hackbridge Hldg.	17/6	14/3	15/-	14/3
4/-	Greengate & Irwell Ord.	6/6	5/3	5/4½	5/9
£1	Harrisons & Crosfield Dd.	64/-	50/-	51/-	50/3
1/-	Hunt & Moscrop Ord.	2/9	1/9	2/-	2/-
£1	Imp. Chem. Ord.	63/9	56/6	58/3	63/9
£1	" " 5% Pref.	18/-	16/3	16/6	16/3
£100	" 4½% Unsec. Loan	£89½	£81	£82	£81½
£100	" 5½% Conv. Loan	£212½	£175	£190	£212½
1/-	Kleemann (O. & M.) Ord.	11/-	8/3	10/-	11/-
£1	" " 6½% Pref.	19/-	17/-	17/9	17/6
2/-	Lacrinoid Prod. Ord.	5/-	3/-	3/-	3/6
5/-	Laporte Ind. Ord.	32/-	25/3	27/9xd	27/3
£1	" " 7½% Pref.	24/3	23/3	23/3	23/3
£1	Leyland & Birm. Rubber Ord.	57/-	46/3	50/6	51/10½
£1	" " " 6% Pref.	19/-	17/6	19/-	18/9
2/-	London Rubber	14/9	11/-	12/10½	13/6
£1	" 6% Red. Cum. Pref.	20/-	18/9	18/9	18/9
£1	McKechnie Bros. Ord.	71/6	57/-	57/-	60/-
£1	" " 'A' Ord.	69/3	56/-	59/-	56/-
£1	" " 6% Cum. Pref.	18/-	16/-	17/-	17/-
5/-	Monsanto Chem. Ord.	28/-	23/3	24/6	26/9
£1	" " 3½% Pref.	12/9	12/-	12/-	12/6
£100	" " 6% Debs.	£103½	£100	£100	£98
5/-	Miles (H.G.) Holdgs. Ord.	11/3	9/9	10/9	10/3
£1	North British Rubber	21/3	17/-	17/-	17/3
5/-	Plastic Enginrs. Ord.	25/-	20/-	24/-	24/6
5/-	Redfern Holdings Ord.	5/9	4/3	5/3	5/-
2/-	RFD Ltd. Ord.	6/6	4/10½	5/-	4/10½
£1	" " 5½% Pref.	14/6	12/9	13/9	13/-
2/-	Rubber Imp. Ord.	7/9	4/6	4/9	4/7½
2/-	" " 'A' Ord.	7/-	3/3	3/6	3/6
£1	" " 5% 1st Pref.	15/-	11/3	12/3	12/3
5/-	Rubber Reg. Ord.	19/3	17/-	17/6	17/6
4/-	Shaw Francis Ord.	27/6	21/3	22/-	22/1½
2/-	Silentbloc Ord.	13/3	10/-	11/-	10/10½
5/-	Storey Bros.	36/6	28/3	33/-	36/6
2/-	Sussex Rubber Ord.	2/3	1/3	1/11½	2/1½
5/-	Sutcliffe Speak Ord.	15/9	11/-	13/-	13/-
£1	Turner & Newall Ord.	115/-	100/-	97/3xd	108/9
£1	" " " 7% Pref.	25/-	22/6	23/3	22/6
5/-	Universal Asbestos Ord.	45/-	32/6	43/-	45/-
5/-	Viscose Dev. Ord.	16/6	14/9	16/-	16/-
5/-	Warne William (Holdgs.) Ord.	18/9	15/3xc	17/-	15/3xc

Rubber Markets

LONDON

After experiencing further sharp falls prior to the weekend, prices were latterly showing signs of developing a fair recovery, mainly on technical considerations. With Singapore displaying a steadier tendency, short covering increased at the lower levels and some Continental demand also developed for early shipments of No. 1 Sheet. Early today October/December landed was 31⅞d. buyer 32⅛d. seller, after sales last Friday at down to 31⅜d. per lb.

Latest prices are as follows:

No. 1 RSS Spot: 31⅝d.-31⅞d.

Settlement House:
August 31⅛d.-32d.
September 32d.-32⅛d.
October/December 32d.-32⅛d.
January/March 31⅛d.-31⅜d.
April/June 31⅛d.-31⅜d.
July/September 30⅞d.-31⅛d.

No. 1 RSS cif basis ports:
July 31⅞d.-32⅛d.
August 31⅞d.-32⅛d.
September 31⅞d.-32⅛d.

Godown:
August 109⅜ cents nominal.

LATEX

Centrifuged 60% latex per gallon in drums, seller, July, 17s. 11d., September, 19s. 5d., October, 19s. 3d., cif European ports. Spot, seller, 18s. 9d. Bulk, nominal, d.w. 18s. 3d. August. Creamed, seller, nominal, 17s. 7d. Normal, seller, July, August, 15s. 1d.

SINGAPORE

The market on July 11 opened uncertain and over one cent below previous final levels. Selling, however, was not sustained and after a quiet period prices went up on short-covering and the reserve of sellers. As enquiry became more widespread selling was restricted to some profit-taking. Lower sheets were neglected. It was a quiet afternoon session. Operators were disinclined to trade. There was some demand for lower sheets, particularly nearby No. 2 and 3 RSS. After hours, quiet conditions prevailed and a slightly easier tendency was noted.

	Malayan cents per lb., fob Malayan ports to open ports	
	July 11	Previous
No. 1 RSS, July	108⅜–108½	108¼–108½
Aug.	108½–108⅝	108¼–108½
No. 2 RSS, July	107⅞–108⅛	107 –108
No. 3 RSS, July	107½–108¼	106¼–107
No. 4 RSS, July	105⅝–106⅜	104⅝–105⅝
No. 5 RSS, July	102⅝–103¾	102 –103¼
No. 1 RSS, Spot	108⅜–108⅞	108¼–108⅜
No. 3 blanket, thick, remilled, crepe, July ..	102½–103½	101½–103½
No. 1 fine pale crepe, July ..	118½–119½	116½–118½
2X thin brown crepe, July ..	101 –102	99⅜–100¼

Tone: Quiet and slightly easier

The Industries Syndicate quote latex, native produce, 60% centrifugal, packed in rectangular drums, fob at 210.00n pence per gallon.

CEYLON

No. 1 RSS

The price of No. 1 RSS at Colombo on July 11 was 121¼ (121¼) Ceylon cents per lb.

NEW YORK

The New York rubber market ruled as under on July 11:

DEALERS' PRICES

	U.S. cents per lb. c & f, ex-dock	
	July 11	Previous
No. 1 RSS, July ..	42⅛a	42n
August..	38⅛a	38⅛a
No. 2 RSS, July ..	42⅛a	41⅛n
August..	38⅛a	38⅛a
No. 3 RSS, July ..	42a	41⅛n
August..	38⅛a	38⅛a
No. 1 RSS, Spot ..	Unq'ted	Unq'ted
No. 3 amber blanket, crepe, September..	35⅛a	35⅛n
No. 1 latex thin crepe, July	41⅛n	41⅛n
No. 1 latex thick crepe, July	41⅛n	41⅛n

FUTURES—REX CONTRACT

	Close	Prev. Close
July ..	43.25t	42.85t
September	38.25b–38.35a	38.15t
November	37.45t	37.25b–37.30a
January ..	37.00t	36.55b–36.70a
March ..	36.55b–36.85a	36.25b–36.55a
May ..	36.10b–36.40a	35.95b–36.25a
July ..	35.70b–36.00a	35.65b–35.95a

Sales: 55 Tone: Steady

Rubber futures were steadier in earlier dealings on light covering but lost the gain later on light selling. Trading was moderately active. Physical rubber was quiet and about steady.

AMSTERDAM

The Amsterdam rubber market ruled as under on July 11:

	Guilders per kilo	
No. 1 RMA	July 11	Previous
July	3.18	3.13
August	3.17	3.17
September ..	3.16	3.16
July/September ..	3.17	3.17
October	3.09	3.08
November ..	3.08	3.07

Sales: 75 Tendency: Steady

DJAKARTA

Some transactions of sheet No. 1 at 33.75 rupiahs per kilo and of sheet No. 3 at 30.25 rupiahs per kilo were reported on July 11. There was more buying interest than of late as prices were below Saturday's levels but towards the close the market was steadier.

	Rupiahs per kilo	
	July 11	Previous
Spot No. 1 Priok ..	33.25b	34.00b
Spot No. 2 Priok ..	32.25b	33.00b
Spot No. 3 Priok ..	30.25b	31.00b
No. 1 fine pale crepe, spot	33.25b	34.00n

Tone: Steadier

BANGKOK

No. 1 RSS

The price of No. 1 RSS at Bangkok on July 11 was 35.25 (36.25) US cents per lb.

STOCK MARKET

Continued from page 104

reaffirmed their confidence in the company's progress and reported that the improvement in profits already known have been more than maintained. Having touched 8s. 3d. at one time the price has now rallied well to 9s. 3d.

From De La Rue came news that the company's volume of exports is being more than maintained. Of the group's profit before tax of £2,282,382, THOMAS DE LA RUE contributed £321,200, FORMICA INTERNATIONAL £1,786,800 and THOMAS POTTERTON £257,100. As stated before the ordinary dividend is raised from 2s. to 2s. 3d. on a larger capital and a one-for-four scrip issue has been proposed.

Turner and Newall has also announced that a one-for-one share bonus is to be handed round. The directors hope to recommend for the current year a final dividend of an amount which, with the 5% interim already announced, will be equivalent to a total distribution of 22½% on the existing ordinary capital.

IMPERIAL CHEMICAL INDUSTRIES, through its South American offshoot DUPERIAL is to invest £5.75m. in a polythene plant in Argentina. It will have an initial capacity of 10,000 tons per annum. And it will also become I.C.I.'s largest single investment in Latin America. The plant will be built at San Lorenzo some 200 miles north of Buenos Aires. Less than a year ago I.C.I. announced that it was spending over £2m. on developing a new industrial site where sulphuric acid and other chemicals would be produced.

Calls for Tenders

Brake Fittings for Pakistan

Ten items of vacuum brake rubber fittings. Required by the Chief Controller of Stores, North Western Railway, Empress Road, Lahore, to whom bids should be sent, quoting Tender No. 210-S/14 (Part III) PIC-60. ESB reference: 17357/60. Closing date July 21 1960.

Moulding Compound for Pakistan

To the value of $5,586. Thermoplastic moulding compound (polystyrene type) in pallet form in standard colours, transparent and opaque, and crystal. Required by Habib and Brothers, 80 Station Road, Chittagong, East Pakistan, to whom bids should be sent, quoting S.A. No. RM.019918. ESB reference: 17381/60/ICA. Closing date: July 22 1960.

All enquiries should be addressed to the Board of Trade, export services branch, Theobalds Road, W.C.1, unless otherwise stated.

Industry INTELLIGENCE

Technical Data

Philblack ISAF and Oil

Rubber Chemicals Bulletin No. 33 issued by Phillips Chemical Company, Akron 8, Ohio, presents results of a systematic evaluation of various levels of Philblack I and a highly aromatic oil in a typical tread compound. The use of high oil and black loadings is desirable to reduce compound costs, but this naturally affects the properties of the compound. If oil and black loadings are increased so as to maintain equal hardness the trends in physical properties are as follows: Compression and permanent set, dynamic deflection and heat build-up all increase while Mooney viscosity, 300% modulus, tensile strength and resilience decrease. Results are presented in tabular and graphical form showing the variation in properties produced by loadings of black from 70-100phr and of oil from 40-70phr.

Hypalon

Hypalon Report No. 1, issued by Du Pont Co. (UK) Ltd., 76 Jermyn Street, London, S.W.1, compares the three grades of Hypalon currently available. All three types possess the outstanding properties associated with the chlorosulphonated polythenes—resistance to weather, ozone, chemicals and heat ageing, and all are also used widely in blends with other elastomers to improve the resulting products.

Hypalon 20, the oldest type, is the most widely used, particularly in blends and for solution coating of flexible substrates. Hypalon 30 is designed primarily for solution coating on rigid substrates. It has lower solution viscosity than the other types and produces harder, dryer and glossier surfaces which are very resistant to soiling. Hypalon 40 is the newest and most versatile of the three types. It is more easily processed and its vulcanizates have better physical and high temperature properties, higher tear strength, and increased oil, compression set, abrasion and flame resistance. For these reasons it is generally preferred for moulded, extruded and calendered goods but, because of its high solution viscosity is not recommended for coating applications.

Thickening Agents

A recent addition to the range of Polysar Technical reports issued by the Polymer Corporation Ltd., distributed in this country by Polymer (UK) Ltd., Walbrook House, Walbrook, London, E.C.4, report is No. 9:5A.

This deals with thickening agents for Polysar latex XPRD-833 which is a medium solids SBR latex recommended for carpet and textile applications. For roll coating and spreading operations, high viscosity compounds are often required, and thickening agents are often required to ensure a uniformly high and stable viscosity. Several commercially available thicknesses have been evaluated in Polysar latex and the results are demonstrated in the report.

Machines, Materials and Equipment

Pocket Magnifier

A pocket magnifier with built-in graticule that folds into a space 2¼in. x 1 7/16in. x ⅞in. has been produced by Graticules Ltd. It has been designed, among other requirements, to fill in the gap between rough measurement with a scale and precise measurement with elaborate and expensive instruments. The scale is on glass mounted in the base of a low powered magnifier, the frame of which is made of aluminium, cut away to give maximum visibility, the field of view being 1in. square. The micrometer scale shows up well against a variety of colours and the graduations are fine enough to allow a reading accuracy of 8 ± .002in.

Rotary Joint

A comprehensive range of redesigned rotary joints has been developed by Weston-Evans and Co., of Clifton, Manchester. This range is intended to augment and gradually replace their existing one, which is used in all industrial processing fields where heating or cooling media is applied to rotating drums, shells or

bowls. Joints can be supplied in duplex (steam feed and condensate outlets in one joint), or single type (one joint for steam feed and one for condensate outlet).

The seal or joint faces consist of a stationary ni-resist nose casting, mounted in the port casting, and sealed off by a heat resisting rubber ring pressurized by phosphor bronze gland ring and robust spring, and a rotating graphite ring secured into a recess at the end of the rotating steel spindle screwed into the cylinder at bowl end. Undesirable rotational tendencies are obviated by the introduction of an anti-torsion device, and the spindle is mounted on ball bearings thus minimizing radial friction.

During development tests, one of these joints effected a million revolutions at a speed of 500rpm passing steam at 60psig with a resultant total face wear of 0.0015in.

Publications

Detecting Flaws

Ultrasonic flaw detection is the subject of Branson Instruments Bulletin T200. The booklet includes operation, techniques, and a complete list of specifications for the Sonoray 5 flaw detector.

The eight-page, illustrated bulletin describes advantages of a new pulse-echo instrument, which is said to have exceptional low-frequency resolving power and penetration. By sending short pulses of acoustic energy at ultrasonic frequencies into the object under test, the flaw detector can examine the interior of plastics and rubber from one side only, and without physical damage. Inspection is claimed to be sensitive and rapid. Defects are indicated by variations in the object's characteristic trace on a cathode ray tube, and approximate depth is determined by a pyramid marker superimposed on the base line.

Principles of pulse-echo testing, by both reflection and through-transmission techniques, are explained in the booklet, obtainable from the company at 40 Brown House Road, Stamford, Connecticut, USA, with schematic drawings. To illustrate the detection of flaws in objects of various shapes and materials, cut-away diagrams show the path of the pulse through the test piece, and indicate typical traces.

Circular Knives

T. G. Wolstenholme have been manufacturing machine knives in Sheffield for various industries for more than half a century. The company has now published a booklet which details the service it gives to a number of fields, including the rubber industry.

A number of products are manufactured for the rubber industry, including circular bias cutting knives with varied types of individually ground teeth, valve punches, vent trimmers, circular skiving knives and tyre groovers.

NR Outlook Sounder

STATISTICALLY the outlook for the natural rubber producer appears to be sounder than ever it has been, said Mr H. C. Medlam, chairman of the Batu Tiga (Selangor) Rubber Co. Ltd., at the 54th AGM held in London on July 11. He went on to say that this was despite the fact that the production of synthetic rubbers had increased from 480,000 tons in 1948 to over 1,500,000 tons in 1959. The fact that nearly 60,000 tons from British and US stockpiles was absorbed in a few months last year, without any marked effect on prices, served to indicate the likelihood of continued expanding demand for natural rubber. It is believed that the most optimistic estimate of natural rubber production by 1965 did not put the figure above 2,400,000 tons. In 1959 the production of natural, at some 2,000,000 tons, fell short of world demand by some 50,000 tons.

Nevertheless, the need for ever expanding research in the various techniques of estate production was manifestly essential if the product is to keep competitive pace and continue to be complementary to synthetics.

Mr Medlam reported that their 1959 crop totalled 2,192,500lb. For the year, 603lb. per acre was harvested from old seedling areas and 1,100lb. per acre from replanted areas. The latter figure did not represent future potential since maximum yields must await full maturity of the younger replants.

Plastics at Utrecht

More than 40 British companies will be represented in the second international plastics exhibition (macroPlastic 1960, Utrecht, October 19-26) to be held in Holland. Altogether over 375,000 sq. ft. of exhibition space will be utilized.

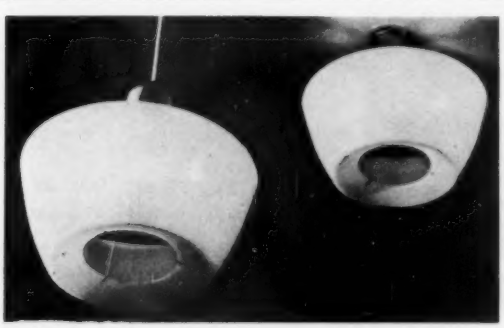
An interesting feature contained in a hall 560ft. in length, will act in a way as a visual catalogue of the exhibition. There, divided into branches of the industry, characteristic aspects of plastics materials and applications displayed elsewhere will be repeated. Each sector of this hall will provide the advisory services of a non-commercial organization representing the branch of the industry concerned. An example is the Building Sector which will be laid out in co-operation with the Rotterdam Building Centre. In all, 19 such sectors are scheduled.

High Polymer Technology

A one-year full-time post-graduate diploma course in high polymer technology is scheduled for the 1960-61 session, starting October 3, at the College of Advanced Technology, Birmingham, one of the eight Colleges of Advanced Technology. The course is intended primarily for graduates in chemistry but is suitable for those with equivalent qualifications and some experience in the plastics and rubber industries. It is recognized for the award of DSIR advanced course studentships.

The syllabus includes 48 lectures on the technology of production of plastics materials; 30 lectures on fabrication and processing plant; nine lectures on rubber technology; nine lectures on surface coating technology and six on synthetic fibre technology. There are also lectures on the chemistry of polymers and on polymers properties. About 18 hours a week are devoted to practical work.

Further particulars of these and related courses — such as the sandwich course in Chemical Technology (Plastics) of four years' duration — can be had from: Head of Chemistry Department, College of Advanced Technology, Gosta Green, Birmingham, 4.



This shade, moulded by Elco Plastics Ltd. is made in a light-stabilised, general purpose grade of Shell Chemical's Carinex polystyrene. Its diffusion efficiency of over 90% provides a glare-free light that has been approved by the Ministry of Education

WELDING THERMOPLASTICS

Recent developments in welding techniques, some of which have been described in *RJIP*, have simplified the operation to such an extent that the welding of thermoplastic materials, notably polythene, polypropylene and rigid PVC, will certainly increase.

One of the most interesting examples is a welding torch developed in the USA. The head of the torch consists of a stainless steel heating chamber with an attached tubular guide for the welding rod. It is claimed that the speed of welding can be as high as 40in. a minute as compared to the approximately four or five inches a minute for ordinary gas welding. A very considerable advantage of this system is that the torch can be held in one hand, with the fingers guiding the filler rod, while the other hand is left free to manipulate the sheet or other components being welded. The torch is available in this country from Goodburn Plastics Ltd.

Rubber Replaces Metal

By incorporating a Cellobond rubber compounding resin into their petrol tubing, Smith's Motor Accessories Ltd. have been able to eliminate the use of metal braiding.

The tubing, which forms the fuel distribution assembly of a combined harvester, has to withstand high burst pressures, must be resistant to petrol and oil and remain unaffected by heat. The resin is said to confer a substantial reinforcement so that the same tube life is obtained even though its wall section is thinner.

TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

FLEXILINE (795,220) Plastics in the form of pastes, being for use in the manufacture of gloves, shoes and clothing. Geoffrey Parker Waddington, Southlands, Welton, Hull, East Yorkshire. (Class 1; May 3 1960).

VARCUM (801,193) Synthetic resin plastics included in Class 1 for use in industry. Beck, Koller and Company (England) Ltd., Beckacite House, Edwards Lane, Speke, Liverpool, 24. (Class 1; May 3 1960).

VAPCO (795,633) Stamping foils and metal coated plastic film, all with or without an adheaive backing and included in Class 6. Vapco Ltd., 54/60 Whitfield Street, London, W.1. (Class 6; May 3 1960).

VAPCOFIX (795,634) and VAPCOLEX (795,635) Stamping foils, metal coated paper and metal coated plastic film, all with or without an adhesive backing and included in Class 6. Vapco Ltd., 54/60 Whitfield Street, London, W.1. (Class 6; May 3, 1960).

DYKEHOUSE SUPER-THERM

(797,922) Injection moulding machines, extrusion moulding machines, and parts of all these goods included in Class 7. The Dykehouse International Co. (U.K.) Ltd., 138 Albert Road, South Norwood, London, S.E.25. (Class 7; May 3 1960).

RAYSIST (786,148) Shielding materials in the form of sheets, blocks, bricks, boards and shaped sections, all for use in insulating against heat and against the emissions of radio-active materials; and insulating materials in plastic form. Knapp Mills Inc., 23-15 Borden Avenue, Long Island City 1, New York, USA. Address for service is c/o Mewburn Ellis and Co., 70-72 Chancery Lane, W.C.2. (Class 17; May 3 1960).

POLYTOP (791,862) Adhesive-backed flexible sheets of plastics included in Class 17 for application to surfaces for protective or decorative purposes. Polycell Products Ltd., 73 Highgate Road, London, N.W.5. (Class 17; May 3 1960).

FLEXOCEL (796,824) Plastics included in Class 17 in the form of sheets, blocks, rods and tubes; artificial rubber and articles included in Class 17 made therefrom; and insulating materials. The Baxenden Chemical Co. Ltd., Clifton House, 83/117 Euston Road, London, N.W.1. (Class 17; May 3 1960).

SPRINGBOKS (B795,186) Cardboard cartons lined with plastics. S. M. Alexander and Co. Ltd., 213-215 Upper Street, Islington, London, N.1. (Class 16; June 7 1960).

FOBRIX (796,722) Blocks made of foamed plastics. Rupert Brooke, 821 The Ridge, St. Leonards-on-Sea, Sussex. (Class 17; June 7 1960).

NEW COMPANIES

A. Ward and Co. (Fabrications) Ltd. (660,738).—May 27. Capital: £5,000 in £1 shares. To acquire that part of the business formerly carried on by A. Ward and Co. (Wolverhampton) Ltd., at Wolverhampton, relating to welding, sheet metal work and dealers and workers in all metals, plastics, etc. The directors are: Arthur Ward, 1 Stafford Place, Shifnal; Norman T. Gallant, 33 Aldersley Road, Tettenhall; and Henry N. Rust. Regd. office: The Forge, Walsall Street, Wolverhampton.

Kantex Plastics Ltd. (660,642).—May 26. Capital: £1,000 in £1 shares. To carry on the business of manufacturers of and dealers in plastics, cork and cork substitutes, caoutchouc, modelling, extruding, binding and moulding materials, etc. The permanent directors are: Donald L. Langrish-Smith, 11 The Grove, Radlett, Herts.; Kenneth L. Langrish-Smith, 72 Deacons Hill Road, Elstree. Regd. office: 103 Cannon Street, E.C.4.

R. A. Brodie Ltd. (660,661).—May 26. Capital: £1,000 in £1 shares. To carry on the business of manufacturers of and dealers in plastic extruded sections, etc. The directors are: Robert A. Brodie and Dorothy J. Brodie, both of 66 Hartley Down, Purley. Regd. office: 29/30 Bedford Row, W.C.1.

Plastic Engineering (Leamington Spa) Ltd. (661,886).—June 9. Capital: £4,000 in £1 shares. The directors are: Raymond Turley, 81 Telford Avenue, Lillington, Leamington Spa; Walter B. Smith, The Flat, Queensway, Leamington Spa; Bernard G. Ough and Martin T. Birt. Regd. office: Queensway Trading Estate, Leamington Spa, Warwicks.

Vestexel Ltd. (661,043).—May 30. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in tyres, etc. The first directors are to be appointed by the subscribers. Secretary: Thomas A. Herbert, 156 Strand, W.C.2.

Shelplasten Ltd. (660,925).—May 30. Capital: £100 in £1 shares. To carry on the business of manufacturers of and dealers in plastic, modelling and moulding materials, etc. The directors are: Anthony J. W. Shelley, 6 Logan Road, Bishopston, Bristol 6; Douglas R. Harris, 29 Northumberland Road, Redland, Bristol 6; Alexander J. Cornish-Trestrail, 136 Cromwell Road, Bristol 6. Regd. office: 46 Apsley Road, Clifton, Bristol 8.

Increases of Capital

Mahawale Holdings Ltd. (644,774). 20 Eastcheap, E.C.3.—Increased by £159,900 in £1 unclassified shares, beyond the registered capital of £100.

Hispeed (Plastic Welding) Ltd. (561,758). 12 South Square, Grays Inn, W.C.1.—Increased by £4,000 in £1 ordinary shares, beyond the registered capital of £1,000.

Precise Plastics (Tottenham) Ltd. (635,850). 166 Darnhills Park Road, N.17.—Increased by £900 in £1 ordinary shares, beyond the registered capital of £100.

Selangor River Rubber Estates Ltd. (269,126). Adelaide House, King William Street, E.C.—Increased by £60,000 in 2s. ordinary shares, beyond the registered capital of £300,000.

This Terylene/cotton conveyor belt running in a West Country limestone quarry has special rubber covers compounded to resist sea air and water. It was made by Barrow, Hepburn and Gale

PATENT LIST

Printed copies of the Specifications in the following list, published by permission of the Controller of H.M. Stationery Office, can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on July 14 1960

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius and Brüning. Process for polymerizing lower olefines in a continuous manner. 841,263.

Red-G.m.b.H., and Cellulose, Polymeres and Derives Cepede S.A. Process and apparatus for the preparation of polyamides. 841,144.

Spinnfaser A.G. Method of improving the quality and reducing the swelling value of regenerated cellulose fibres. 841,146.

Farbwerke Hoechst Aktiengesellschaft Vorm. Meister, Lucius and Brüning. Process for the stabilization of halogen-containing polymers. 841,151.

Columbia-Southern Chemical Corporation. Siliceous rubber reinforcing pigments and in rubber compositions reinforced therewith. 841,156.

O. W. Burke. Vulcanizable compositions. 841,159.

Monsanto Chemical Co. Polymerization of ethylene. 841,324.

Snia-Viscosa Soc. Nazionale Industria Applicazioni Viscosa. Production of filaments of synthetic linear polymers. 841,327.

A. Sestini. Treatment of plastic materials to increase their adhesive capacity to inks and colours. 841,329.

Minnesota Mining and Manufacturing Co. Ltd. Device for dispensing self adhesive paper labels in reels. 841,023.

Goodrich-Gulf Chemicals Inc. Treatment of olefin polymers. 841,290.

Celanese Corporation of America. Cellulose propionate composition. 841,212.

Esso Research and Engineering Co. Polymerization process and products thereof. 841,295.

Imperial Chemical Industries Ltd. Production of films from polymeric materials. 840,819.

Esso Research and Engineering Co. Method of making polymer latices. 841,289.

Imperial Chemical Industries Ltd. Thermoplastic moulding compositions. 841,215.

Union Carbide Corporation. Preparation of thermoplastic resin particles. 840,899.

Rohm and Haas Co. Bonded fibrous product and method of making same. 840,900.

Imperial Chemical Industries Ltd. Production of polimers. 841,308.

Aeroplastics Ltd. Methods of manufacturing hollow bodies of synthetic-resin-impregnated glass fibre. 841,371.

Monsanto Chemical Co. Vinyl chloride interpolymers. 841,075.

C. Macbeth. Plastic moulding and metal die-casting machines. 841,494.

Armour and Co. Spinning of viscose. 840,902.

Imperial Chemical Industries Ltd. Vulcanization of synthetic rubbers. 841,079.

Petrochemicals Ltd. Manufacture of polyolefins. 840,859.

Imperial Chemical Industries Ltd. Polymerization method and polymers produced thereby. 841,388.

Farbenfabriken Bayer A.G. Process for the production of synthetic elastomeric shaped articles. 841,392.

Farbenfabriken Bayer A.G. Dveing shaped articles of polyesters or cellulose triacetate. 841,169.

Petrochemicals Ltd. Manufacture of polymeric materials by Ziegler polymerization processes. 840,861.

Changes of Name

Hevea (Johore) Rubber Plantations, Ltd. (110,103). Augustine House, Austin Friars, E.C.2.—Name changed to Linee Products Ltd., on January 13 1960.

Pardoes Rubber Company Ltd. (572,663). 2 York Road, Blackheath, Staffs.—Name changed to Pardoes Rubber and Plastic Co. Ltd., on January 22 1960.

R·J·I·P· CLASSIFIED ADVERTISEMENTS

APPOINTMENTS VACANT

6d. a word, Minimum 10/-. Box 2/-.

A QUALIFIED cost and works accountant is required as manager for the estimating department of a large industrial company in S.W. London. The position is permanent and pension facilities are available. This year's holiday commitments will be honoured. Applications, giving details of experience and salary required, are invited.—Box 397. (397)

ASSISTANT development chemist required by rubber manufacturers in Manchester area. L.I.R.I. qualification preferred. Work will cover a variety of engineering products in the rubber and plastics field. Excellent opportunities for advancement for an energetic man.—Write giving details of education, qualifications, age and experience, to Box 391. (391)

CHIEF INSPECTOR. Large company in the Manchester area will shortly have a vacancy for a chief inspector. The post will involve complete responsibility for the quality of a wide range of products, varying from simple components to fairly complex assemblies. Staff controlled is about 100. Applications are invited from senior inspectors already well versed in government and commercial inspection procedures. Age limits 30/45. Some knowledge of engineering essential. Experience in the rubber industry is desirable but not essential. Academic qualifications are less important than those personal attributes essential in this sphere. Salary and conditions of service are in line with the responsibilities and demands made by this post, which is regarded as a key position.—Brief details in first instance please to Box 401. (401)

DEVELOPMENT chemist required by rubber and plastics manufacturers in Manchester area. Age under 30 with A.I.R.I. or A.N.C.R.T. qualification. Previous industrial experience is not essential. Work will cover development in many fields of rubber and plastics products, the object being to encourage the widest possible knowledge of the Company's activities which is mainly concerned with service to the engineering industries. —Write giving details of education and qualifications etc., to Box 390. (390)

GENERAL MANAGER

required by old established Rubber Manufacturers in the Greater London area; directly responsible to the Board. Applicants must possess that sound knowledge of rubber technology and general engineering, and the capability of planning and controlling production that is essential for the position, which has brilliant prospects and carries a commencing salary of up to £5,000 per annum.—Replies in confidence to Box 396. (396)

ESTIMATOR, fully experienced with the manufacture of general rubber goods, required by expanding rubber company in Birmingham. Present staff notified.—Apply giving age and details of experience to Box 399. (399)

PROGRESSIVE rubber and plastic manufacturers, Southern England, seek assistant to works manager, maximum age 45, with view to appointment to works manager in due course. Ability control labour and knowledge up-to-date rubber technology both essential. Write giving experience and copies of references, salary and full details.—Box 400. (400)

TECHNICAL assistant in development laboratory for work on natural and synthetic rubber compounds and plastics. Preferred age 19-22 years, with L.I.R.I. Applications from final year students for L.I.R.I. will be considered.—Applications to Chief Cable Engineer, Hackbridge Cable Co. Ltd., Kelvin Works, Hackbridge, Surrey. (363)

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LETTERS addressed to the Personnel Manager will be treated in strict confidence and when interviews follow we shall aim at giving candidates full information.

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'COTSWOLD' dipping machines and circulating tanks for latex and PVC. New catalogues now available on request.— Lionel Hook and Sons, Ebley, Stroud, Glos. Tel.: Stonehouse 614/5. (380R)

FOUR up-stroke 'Morane' presses 30in. x 60in., 15in. ram, 14in. traverse. Working pressure 1,700lbs. variable daylight. Can be seen in use.—Andre Rubber Co. Ltd., Kingston By-pass, Surbiton, Surrey. (402)

MANUFACTURERS of roughing machines for rubber sheeting, sponge rubber, splitting machines, leather cloth plant, embossing plates and rollers, spreading machines and presses.— G. L. Murphy Ltd., Imperial Works, Menston, Nr. Leeds. (238R)

MANUFACTURERS of PVC spreading and combining machines, rubber, splitting, scouring and dusting machines, presses.—G. L. Murphy Ltd., Imperial Works, Menston, Nr. Leeds. (368)

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NEW market opportunity. Manufacturers or wholesale distributors of rubber, plastics and allied products desirous of exploring market possibilities in the West Indies and Jamaica in particular are invited to contact a progressive and responsible firm of manufacturers' agents interested in new lines.—Reply to E. M. Gayle, M.A., B.Ss., P.O. Box 66, Kingston, 4, Jamaica, West Indies. (256)

TECHNICAL REPRESENTATIVES. Representatives required by well-known city company concerned with marketing in UK wide range of chemicals for leading American supplier. Applicant must possess a degree in chemistry and preferably have experience in industry involving organic chemicals. Car provided. Position is an interesting one carrying good prospects and salary.—Reply giving full details of qualifications, experience, etc., to Box 404. (404)

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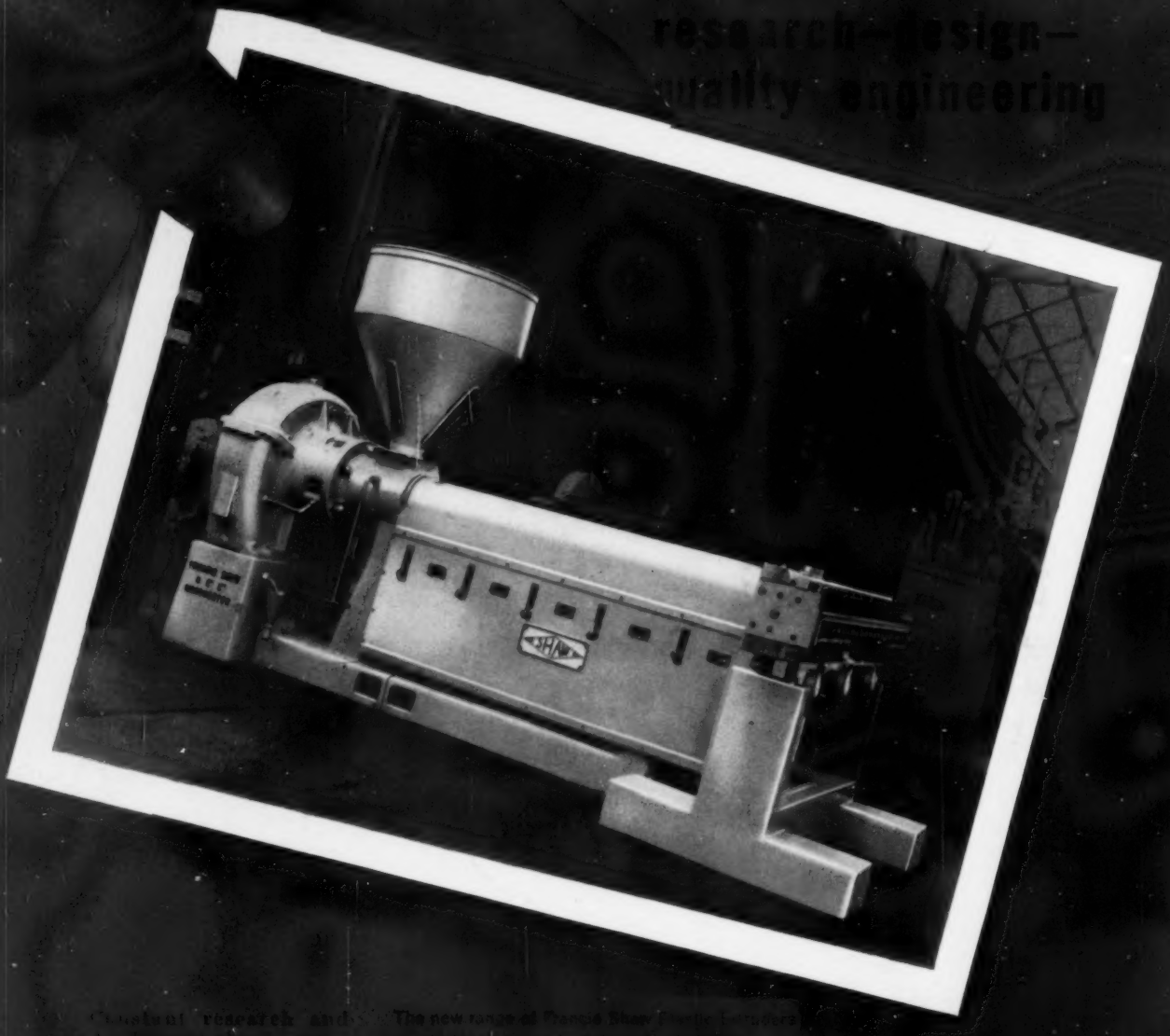

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